Volume 156 July-December 1979

NATIONAL GEOGRAPHIC

INDEX

July-December 1979

VOLUME 156

PUBLISHED BY THE
NATIONAL GEOGRAPHIC SOCIETY
WASHINGTON, D. C.

UMI

NATIONAL GEOGRAPHIC SOCIETY

WASHINGTON, D. C.

Organized "for the increase and diffusion of geographic knowledge"

GILBERT HOVEY GROSVENOR
Editor, 1899-1954; President, 1920-1954
Chairman of the Board, 1954-1966

THE NATIONAL GEOGRAPHIC SOCIETY is chartered in Washington, D.C., in accordance with the laws of the United States, as a nonprofit scientific and educational organization. Since 1890 the Society has supported 1,727 explorations and research projects, adding immeasurably to man's knowledge of earth, sea, and sky. It diffuses this knowledge through its monthly journal, NATIONAL GEOGRAPHIC; its books, globes, atlases, filmstrips, and educational films; *National Geographic WORLD*, a magazine for children age 8 and older; information services; technical reports; exhibits in Explorers Hall; and television.

ROBERT E. DOYLE, President
GILBERT M. GROSVENOR, Vice President
OWEN R. ANDERSON, Vice President and Secretary
HILLEARY F. HOSKINSON, Vice President and Treasurer
WILLIAM T. BELL, FRANK S. DELK,
LEONARD J. GRANT, RAYMOND T. McELLIGOTT, JR.,
C. VERNON SANDERS, EDWIN W. SNIDER
Associate Secretaries

BOARD OF TRUSTEES

MELVIN M. PAYNE, Chairman of the Board
LLOYD H. ELLIOTT, Vice Chairman
President, George Washington University
MELVILLE BELL GROSVENOR, Chairman Emeritus
THOMAS W. McKNEW, Advisory Chairman

THOMAS E. BOLGER
Executive Vice President, American Telephone & Telegraph Company
FRANK BORMAN, Chairman of the Board and President, Eastern Airlines
J. CARTER BROWN, Director, National Gallery of Art
WARREN E. BURGER
Chief Justice of the United States
ROBERT E. DOYLE, President, National Geographic Society
GEORGE M. ELSEY, President, American Red Cross
GILBERT M. GROSVENOR
Editor, National Geographic
ARTHUR B. HANSON, General Counsel, National Geographic Society
CARYL P. HASKINS, Former President, Carnegie Institution of Washington
JEROME H. HOLLAND
Former U. S. Ambassador to Sweden
CARLISLE H. HUMELSINE
Chairman of the Board, The Colonial Williamsburg Foundation
MRS. LYNDON B. JOHNSON
CURTIS E. LeMAY, Former Chief of Staff, U. S. Air Force
WM. McCHESNEY MARTIN, JR.
Former Chairman, Board of Governors, Federal Reserve System
LAURANCE S. ROCKEFELLER
President, Rockefeller Brothers Fund
ROBERT C. SEAMANS, JR.
Dean of the School of Engineering, Massachusetts Institute of Technology
FREDERICK G. VOSBURGH
Former Editor, National Geographic
JAMES H. WAKELIN, JR., Former Assistant Secretary of Commerce for Science and Technology
JAMES E. WEBB, Former Administrator, National Aeronautics and Space Administration
CONRAD L. WIRTH, Former Director, National Park Service

Trustees Emeritus

CRAWFORD H. GREENEWALT
JUAN T. TRIPPE
LOUIS B. WRIGHT

COMMITTEE FOR RESEARCH AND EXPLORATION

MELVIN M. PAYNE, Chairman
T. DALE STEWART, Vice Chairman
EDWIN W. SNIDER, Secretary

BARRY C. BISHOP, National Geographic Staff, ROBERT E. DOYLE, GILBERT M. GROSVENOR, MELVILLE BELL GROSVENOR, CARYL P. HASKINS, STERLING B. HENDRICKS, Scientist Emeritus, U. S. Department of Agriculture, THOMAS W. McKNEW, BETTY J. MEGGERS, Research Associate-Anthropology, Smithsonian Institution, GEORGE E. STUART, FREDERICK G. VOSBURGH, JAMES H. WAKELIN, JR., GEORGE E. WATSON, Curator of Birds, Smithsonian Institution, FRANK C. WHITMORE, JR., Research Geologist, U. S. Geological Survey, CONRAD L. WIRTH, LOUIS B. WRIGHT, and PAUL A. ZAHL, Former Senior Scientist, National Geographic Staff

ASSISTANT SECRETARIES OF THE SOCIETY: Joseph B. Hogan, James P. Kelly, Adrian L. Loftin, Jr., Lewis P. Lowe, Ward S. Phelps, Cletis Pride

ASSISTANT TREASURER: Alfred J. Hayre. *Assistants to the President:* Earl Corliss, Jr., Richard E. Pearson. *Administrative:* D. Evelyn Carnahan, Janet C. Soper

SECRETARY'S STAFF: *Accounting:* Martha Allen Baggett, Dorothy L. Dameron, Jay H. Givans, Laura L. Leight, William G. McGhee, George E. Newstedt, David H. Peters. *Administration:* Ruth E. Clark, Frederick C. Gale, Robert V. Koenig, Zbigniew Jan Lutyk, Ross L. Mulford, Joyce S. Sanford, Karen F. Shrewsberry, Nell G. Snow, Frank M. Twigger. *Computer:* James G. Schmelzer. *Educational Services:* Wendy G. Rogers, Carl W. Harmon, Jr. *Employee Benefits:* Howard R. Hudson, Mary L. Whitmore. *Explorers Hall:* Peter Purpura. *Membership Services:* Margaret L. Bassford, Robert C. Dove, Erma T. Goetzinger, William T. McDonnell, Jimmie D. Pridemore, Charles P. Thomas, Paul B. Tylor, Dorothy M. Wagner, Marguerite M. Wise, Peter F. Woods. *Personnel:* Thomas L. Hartman, M.D., Robert E. Howell, Glenn G. Pepperman, Shirley N. Wilson. *Printing:* Joe M. Barlett, Frank S. Oliverio, Hans H. Wegner. *Promotion:* Charles T. Kneeland, Robert J. Warfel, Eileen W. Bowering, Robert L. Feige, Joseph S. Fowler, Thomas M. Kent, F. William Rath, Towne Windom. *Purchasing:* Robert G. Corey, Thomas L. Fletcher, Sheila H. Immel

ADVERTISING: *Director:* James L. Till, 1251 Avenue of the Americas, New York 10020. *Asst. to Dir.:* Blanche Coffey. *Assoc. Sales Director:* George W. Kellner. *Managers—East:* Bart W. McDonnell, New York. *Midwest:* Robert R. Henn, Chicago. *San Francisco:* Cecil H. London. *Los Angeles:* Richard H. Lehman. *Detroit:* George E. Moffat. *International Editions:* Robert W. Horan, New York. *Travel:* Gerald A. Van Splinter, New York. *Europe:* Michel A. Boutin, Paris. *Business Manager:* Peter W. Michaels. *Production Manager:* G. Sarita Lapham

COPYRIGHT © 1980 National Geographic Society, 17th and M Sts. N.W., Washington, D. C. 20036.

MELVIN M. PAYNE *Chairman of the Board*
ROBERT E. DOYLE *President of the Society*
MELVILLE BELL GROSVENOR *Editor Emeritus*

NATIONAL GEOGRAPHIC MAGAZINE

GILBERT M. GROSVENOR *Editor*

W. E. GARRETT *Associate Editor, Illustrations*
JOSEPH JUDGE *Associate Editor, Text*

SENIOR ASSISTANT EDITORS

James Cerruti, *Contract Writers* Richard J. Darley, *Cartography*
Robert E. Gilka, *Photography* William Graves, *Expeditions*
Edward J. Linehan, *Manuscripts* Samuel W. Matthews, *Production*
O. Louis Mazzatenta, *Layout* Howard E. Paine, *Art*
Carolyn Bennett Patterson, *Legends* Thomas R. Smith, *Illustrations*
Kenneth F. Weaver, *Science* Ann K. Wendt, *Research*
Herbert S. Wilburn, Jr., *Control Center*

TEXT

ASSISTANT EDITORS: Rowe Findley, Allan C. Fisher, Jr., Robert P. Jordan, Bart McDowell, Elizabeth A. Moize, Merle Severy

SENIOR WRITERS: Thomas J. Abercrombie, David S. Boyer, William S. Ellis, Howard La Fay, John J. Putman, Volkmar Wentzel, Peter T. White

SENIOR EDITORIAL STAFF: Harvey Arden, Kent Britt, Thomas Y. Canby, Mike Edwards, Boyd Gibbons, Rick Gore, Noel Grove, Alice J. Hall, Bryan Hodgson, Michael E. Long, Ethel A. Starbird, Gordon Young

EDITORIAL STAFF: Robert Booth, Thomas J. Colin, John L. Eliot, David Jeffery, John L. McIntosh, George E. Stuart, Priit J. Vesilind

RESEARCH: Frances H. Parker (Associate Chief); Carolyn H. Anderson, Susan L. Anderson, Judith Brown, Susan P. Byrnes, Susan Day Fuller, Ann B. Henry, Jan Holderness, Patricia B. Kellogg, Kathy B. Maher, Jean B. McConville, Jeanne E. Peters, Lesley B. Rogers, Frances W. Shaffer. *Style:* Michaeline A. Sweeney. *Geographic Information:* Bette Joan Goss. *Legends:* Abigail A. Tipton

ILLUSTRATIONS

PHOTOGRAPHERS: Dean Conger, Joseph J. Scherschel (Assistant Directors); James L. Amos, James P. Blair, Victor R. Boswell, Jr., Jodi Cobb, Bruce Dale, Gordon W. Gahan, David Alan Harvey, Otis Imboden, Emory Kristof, Bianca Lavies, Bates Littlehales, Robert W. Madden, George F. Mobley, Robert S. Oakes, Steve Raymer, Robert F. Sisson *(Natural Science)*, James L. Stanfield. *Administration:* John E. Fletcher, Susan A. Smith

ILLUSTRATIONS EDITORS: W. Allan Royce (Assistant Chief); David L. Arnold, Taylor Gregg, Declan Haun, H. Edward Kim *(Layout)*, Bruce A. McElfresh, Charlene Murphy, Robert S. Patton, Elie S. Rogers, Jon Schneeberger, Mary Griswold Smith *(Research Projects)*

ART: William N. Palmstrom (Chief); Walter Q. Crowe, John D. Garst, Jr. (Assistant Chiefs). *Artists:* Lisa Biganzoli, William H. Bond, John W. Lothers, Jaime Quintero, Ned M. Seidler. *Cartographic Artist:* Snejanka Stefanoff. *Map Editor:* John T. Blozis. *Research:* Virginia L. Baza, Harold A. Hanson, Dorothy A. Nicholson. *Production:* Isaac Ortiz (Supervisor); Iskandar Baday, Elie Sabban, Alfred L. Zebarth, Leo B. Zebarth

DESIGN: Charles C. Uhl, Robert E. Pullman, Betty A. Clayman

ENGRAVING AND PRINTING: Dee J. Andella (Director); William W. Smith (Assistant Director); Bill M. Aldridge, John T. Dunn, John R. Metcalfe, James R. Whitney

CARTOGRAPHY

John F. Shupe (Associate Chief); Ted Dachtera, Richard K. Rogers (Assistant Chiefs); John F. Dorr (Art Director); Margery K. Barkdull, Charles F. Case, Henri A. Delanghe, Russel G. Fritz, Charles W. Gotthardt, Jr., Thomas L. Gray, Catherine M. Hart, Donald A. Jaeger, Harry D. Kauhane, Mary C. Latham, Mary Anne McAleer, Charles L. Miller, Roland R. Nichols, Robert W. Northrop, Charles L. Stern, Douglas A. Strobel, Tibor G. Toth, Thomas A. Wall, Thomas A. Walsh

EDITORIAL SERVICES

ADMINISTRATION: Joyce W. Graves (Assistant to the Editor), Elaine R. Chisman, Lilian Davidson, Virginia H. Finnegan, Mary F. Klemann, Lucille L. McInerney, Shirley Neff, Barbara A. Shattuck, M. Jean Vile, Barbara L. Wyckoff. *Correspondence:* Carolyn F. Clewell, Clifford R. DuBois. *Indexes:* Jolene M. Blozis. *Travel:* Virginia A. Bachant

PHOTOGRAPHIC LABORATORIES AND TYPESETTING: Carl M. Shrader (Chief); Milton A. Ford (Associate Chief); Lawrence F. Ludwig (Assistant Chief); Herbert Altemus, Jr., David H. Chisman, Ellwood M. Kohler, Jr., Geoffrey T. McConnell, William S. Petrini, Claude E. Petrone, Joan S. Simms (Assistant)

LIBRARIES: *Publications:* Virginia Carter Hills (Librarian); Patricia Murphy Smith, Carolyn Locke, Louise A. Robinson, Marta Strada. *Illustrations:* L. Fern Dame, Carolyn J. Harrison. *Records:* Lorie Northrop, Mary Anne McMillen. *Films:* Betty G. Kotcher

RELATED EDUCATIONAL SERVICES OF THE SOCIETY

SENIOR ASSISTANT EDITORS

Robert L. Breeden, *Special Publications and School Services*
Charles O. Hyman, *Book Service*

BOOK SERVICE: Thomas B. Allen, Seymour L. Fishbein (Associate Chiefs); Ross Bennett, Constance Brown Boltz, Mary H. Dickinson, Robert C. Firestone, Anne Dirkes Kobor, J. Edward Lanouette, Carol Bittig Lutyk, David F. Robinson, Shirley Scott, Margaret Sedeen, Verla Lee Smith

SPECIAL PUBLICATIONS AND SCHOOL SERVICES: Donald J. Crump (Associate Chief); Philip B. Silcott (Assistant Chief); William L. Allen, Jody Bolt, Toni Eugene, Ron Fisher, William R. Gray, Sallie M. Greenwood, Mary Ann Harrell, Suzanne J. Jacobson, Geraldine Linder, Tee Loftin, Louisa V. Magzanian, Tom Melham, Robert Messer, Jennifer C. Urquhart, Ursula Perrin Vosseler, George V. White, Merrill Windsor. *National Geographic WORLD:* Ralph Gray (Editor); Ellen Joan Hurst, Margaret McKelway, Pat Robbins, Eleanor Shannahan, Veronica Smith. *Books for Young Explorers:* Cynthia Ramsay. *Filmstrips:* Jimmie Abercrombie, James B. Caffrey, Margery G. Dunn, Jacqueline Geschickter, Jane R. McCauley, H. Robert Morrison, George Peterson, Judith E. Rinard, Joan Ann Straker

NEWS SERVICE: Paul Sampson (Chief); Donald J. Frederick, William J. O'Neill, Robert C. Radcliffe. **TELEVISION AND EDUCATIONAL FILMS:** Dennis B. Kane (Chief); Marjorie M. Moomey *(Research)*; Patricia F. Northrop *(Promotion)*; Sidney Platt *(Educational Projects)*; Yeorgos N. Lampathakis, Carl E. Ziebe. **LECTURES:** Joanne M. Hess (Chief); Ronald S. Altemus, Robert G. Fleegal, Mary W. McKinney, Gerald L. Wiley. **RECORDINGS:** John M. Lavery (Chief). **AUDIOVISUAL:** Jon H. Larimore

Contents

Page

JULY 1979

OUR NATIONAL PARKS
Photographs by David Alan Harvey

THE BEST OF OUR LAND (Editor's Page) 1
By Gilbert M. Grosvenor

PARKS GRANDEUR IN PICTURES 3

A LONG HISTORY OF NEW BEGINNINGS 18
By Melville Bell Grosvenor

WILL SUCCESS SPOIL OUR PARKS? 31
By Robert Paul Jordan

SHARING ALASKA: HOW MUCH FOR PARKS? 60
Opposing views by Jay S. Hammond and Cecil D. Andrus

TREKKING AROUND THE CONTINENT'S HIGHEST PEAK (MOUNT McKINLEY) 66
Article and photographs by Ned Gillette

OUR PEOPLE, OUR PAST (NAVAJOS) 81
By Albert Laughter

GATEWAY—ELBOW ROOM FOR THE MILLIONS 86
By Louise Levathes

GOLDEN GATE—OF CITY, SHIPS, AND SURF 98
By David S. Boyer

ECHOES OF SHILOH 106
By Shelby Foote

A GUIDE TO PARKLANDS 111

SPRING COMES LATE TO GLACIER 124
By Douglas H. Chadwick

GUADALUPE'S TRAILS IN SUMMER 135
By Edward Abbey

AUTUMN—SEASON OF THE SMOKIES 142
By Gordon Young

GRAND TETON—A WINTER'S TALE 148
By François Leydet

AUGUST 1979

EDITOR'S PAGE 153

MYSTERIES OF BIRD MIGRATION 154
By Allan C. Fisher, Jr., with photographs by Jonathan Blair
Double supplement included—*The Americas* and *Bird Migration in the Americas*

WALK ACROSS AMERICA: PART II 194
Text and photographs by Peter and Barbara Jenkins

YELLOW SEA YIELDS SHIPWRECK TROVE 231
Photos by H. Edward Kim

NORTH YEMEN 244
By Noel Grove, with photographs by Steve Raymer

THE HARD LIFE OF THE PRAIRIE DOG 270
By Tim W. Clark, with photographs by Patricia Caulfield

THE INADAN: ARTISANS OF THE SAHARA 282
Article and photographs by Michael and Aubine Kirtley

SEPTEMBER 1979

EDITOR'S PAGE 299

BAHRAIN: HUB OF THE PERSIAN GULF 300
By Thomas J. Abercrombie, with photographs by Steve Raymer

UMI

Page

THE SEARCH FOR THE FIRST AMERICANS 330
By Thomas Y. Canby, with photographs by Kerby Smith and paintings by Roy Andersen

OSHKOSH: AMERICA'S BIGGEST AIR SHOW 365
By Michael E. Long, with photographs by James A. Sugar and the author

TROUBLE IN BAYOU COUNTRY 377
By Jack and Ann Rudloe, with photographs by C. C. Lockwood

ST. VINCENT, THE GRENADINES, AND GRENADA:
TAKING IT AS IT COMES 399
By Ethel A. Starbird, with photographs by Cotton Coulson

MOSQUITOS, THE MIGHTY KILLERS 426
By Lewis T. Nielsen

OCTOBER 1979

EDITOR'S PAGE 441

TWO ENGLANDS 442
By Allan C. Fisher, Jr., with photographs by Cary Wolinsky (Stock, Boston)
Double supplement included—*British Isles* and *Medieval England*

ALONG THE GREAT DIVIDE 483
By Mike Edwards, with photographs by Nicholas DeVore

FIBER OPTICS: HARNESSING LIGHT BY A THREAD 516
By Allen A. Boraiko, with photographs by Fred Ward (Black Star)

GUILIN, CHINA'S BEAUTY SPOT 536
Article and photographs by W. E. Garrett

LEARNING THE WAYS OF THE WALRUS 564
By G. Carleton Ray, with photographs by Bill Curtsinger

SKYLAB'S FIERY FINISH 581
By Tom Riggert

NOVEMBER 1979

EDITOR'S PAGE 585

THE DESERT: AN AGE-OLD CHALLENGE 586
By Rick Gore, with photographs by Georg Gerster

WINGED VICTORY OF *GOSSAMER ALBATROSS* 640
By Bryan Allen

WHICH WAY OAHU? 652
By Gordon Young, with photographs by Robert W. Madden

INCREDIBLE WORLD OF DEEP-SEA RIFTS
1. STRANGE WORLD WITHOUT SUN 680
By the Editor
2. RETURN TO OASES OF THE DEEP 689
By Robert D. Ballard and J. Frederick Grassle

HONG KONG'S REFUGEE DILEMMA 709
By William S. Ellis, with photographs by William Albert Allard

BOOKS FOR WORLD EXPLORERS 7321
Far-Out Facts; The Mysterious Undersea World; Secrets From the Past; Wildlife Alert!

DECEMBER 1979

EDITOR'S PAGE 733

OUR WILDEST WILDERNESS: THE ARCTIC WILDLIFE RANGE 737
By Douglas H. Chadwick, with photographs by Lowell Georgia

SEOUL: KOREAN SHOWCASE 777
Article and photographs by H. Edward Kim

OREGON'S LOVELY, LONELY COAST 798
By Mark Miller, with photographs by Cotton Coulson

THE MAGIC WORLD OF HANS CHRISTIAN ANDERSEN 825
By Harvey Arden, with photographs by Sisse Brimberg

GRAVEYARD OF THE QUICKSILVER GALLEONS 850
By Mendel Peterson, with photographs by Jonathan Blair

UMI

Index

VOLUME 156 JULY-DECEMBER 1979

July	pp.	1-152	October	pp.	441-584
August	pp.	153-298	November	pp.	585-732
September	pp.	299-440	December	pp.	733-876

Titles and illustrations in bold face

A

AK-47 (assault rifle) **248,** 252, 260, 268
Aali, Bahrain: Tombs, ancient **324**
Abardokh, Niger 286, 296
Abbey, Edward: ***Guadalupe's Trails in Summer.*** July, 135-141
Abercrombie, Thomas J.: ***Bahrain: Hub of the Persian Gulf.*** Sept., 300-329
Able, Kenneth P. **164,** 180, 185, 189
Aboulaye (Inadan) **294,** 296
Acadia National Park, Maine 26
Acadians *see* Cajuns
Ackerly, Texas 636
Ackerman, Robert E. 342
Acorn worms 688
Acoustic velocity meter **684**
Adams, Mike 576
Aden, South Yemen 248, 250, 251
Adovasio, James M. 354-355
Aerobatic teams: Red Devils **364,** 365, **369**
Aerobatics: Competition 368, judge **368;** Maneuver diagram **368**
Aeronautics: *Gossamer Condor* 640, 645; *see also* Gossamer Albatross, *outlined*
Africa: ***The Desert: An Age-old Challenge.*** By Rick Gore. Nov., 586-639; Malaria 431, 436, map showing 430; Yellow fever 436, map showing 430; *see also* Niger
Agadez, Niger 282, 286, 296
Agriculture *see* Farms and farming
Ahmad, Imam 254
Ahoudan (Inadan) 286, 288, **292-293**
Ahvaz, Iran: Sand dune reclamation **620-623**
Aichilik River, Alaska 768
Air (region), Niger: ***The Inadan: Artisans of the Sahara.*** By Michael and Aubine Kirtley. Aug., 282-298
Air conditioning, ancient: Yazd, Iran 616
Air lift: Underwater excavation **859,** 867, 874
Air pollution: Seoul, South Korea 770, 784
Air shows: ***Oshkosh: America's Biggest Air Show.*** By Michael E. Long. Sept., 365-375
Air-traffic controllers: Oshkosh, Wis. **367, 371**
Aircraft: Optical-fiber use 516, 518, 533; ***Oskosh: America's Biggest Air Show.*** By Michael E. Long. Sept., 365-375; ***Winged Victory of*** **Gossamer Albatross.** By Bryan Allen. Nov., 640-651
Airstrip, abandoned: Sakhir, Bahrain **314-315**
Akaishi Maru (freighter): Seamen playing golf **810;** Wood-chip loading **810**
Akron, Ohio: National park 19, 32, 89
Ala Moana Park, Honolulu, Oahu, Hawaii 658
Ala Wai Canal, Oahu, Hawaii **654-655**
Alabama: National park 26, 49
Alaska: National park system 2, 19, 26, ***Sharing Alaska: How Much for Parks?*** By Jay S. Hammond and Cecil D. Andrus. July, 60-65, ***Will Success Spoil Our Parks?*** By Robert Paul Jordan. July, 31-59; Oil 745, 755; Paleo-Indians 332, 333, 335, 338, 340; Wildlife *see* Walruses, Pacific; Wildlife refuges 733 *see also* Arctic National Wildlife Range, *outlined; see also* Mount McKinley National Park
Alaska Native Claims Settlement Act (1971) 63
Alberta (province), Canada: Paleo-Indian remains 351
Albright, Horace 26
Alcatraz Island, Calif. **23-24,** 101, 103, 104; Convicts 19, 104, former **100,** 101
Aleuts (people) 41, 63, 64
Alfred, N. Y. 199, 226
Ali, Jafar 305
Alice Springs, Australia: Desert reclamation **618;** Rabbit problem 624
Alimonzo, Issoufi 603
Alison, John 548, 549
Alkaloid stimulant 252, **252-253,** 260, 267
Al Kibs, North Yemen 259, 260; *kat* chew **252-253,** 260
Alkibsi, Ibrahim 259, 260
Allard, William Albert, photographer: ***Hong Kong's Refugee Dilemma.*** Nov., 709-732
Allen, Bryan 585, **644, 650;** ***Winged Victory of*** **Gossamer Albatross.** Nov., 640-651
Alligator gar **198**
Alligator-trapping: Louisiana 197, 198, 204
Allred, Ruby 636
Al Mukha, North Yemen: Coffee exports 267; Port 267
Along the Great Divide. By Mike Edwards. Oct., 483-515
Alpha-Bit Café and Bookstore, Mapleton, Oreg. 814, 816-817
Alpha Farm (community), Deadwood, Oreg. 814
Alpha Helix (research ship) 574
Aluminum Bahrain (ALBA) 312, 313
Alvin (research submersible) 585, **680,** 682, **684, 685,** 689, 693, 695, 702, **705;** Equipment **684,** CCD camera **684, 705,** heat probe **684, 692, 702,**
Amalienborg Palace, Copenhagen, Denmark 842, 845; Danish Royal Guard 842, 845-846
Ambler, Alaska 42
al-Ameer, Jassim 313
America (rock group): Song by 636
American Mosquito Control Association 436, 438
American Optical Corporation 528; Fused fiber-optic components **528**
Amiama Castillo, Francisco 876
Amino acid racemization (dating method) 333, 351
Ammar (tribe): North Yemen 260
Amore cosmetics factory, Seoul, South Korea **778**
Amud (Inadan elder) 289
Anadyr, Gulf of, U.S.S.R.: Walruses 572
Anasazi (Indians) 81-82, 85
Andersen, Hans Christian: ***The Magic World of Hans Christian Andersen.*** By Harvey Arden. Dec., 825-849
Birthplace 832, 833, 834, **834**
Character 826, 832, 834, 836, 838, 844
Death 849
Education 844
Fairy tales: First volume 839; Number of 845
Fame 825, 833, 834, 836, 838, 844, 845, 847, 849
Grandparents 834, 836
Grave 848, 849
Homes: Copenhagen **832,** 846, 847; Odense 833, 834
Illustration of **839**
Loneliness 832, 836, 838, 847
Museum 833, **834, 835**
Paper cuttings **835, 836, 839**
Parents 833, 834, 836, 838
Photographs of **824, 832, 840**
Physique **824,** 826, 834, 838, 841, 844, 849
Poverty 825, 826, 833, 834
Theatrical career 836, 838, 841, 844
Travels 847
Works 839, 841, 844, 845 *see also* Fairy tales, *above*
Youth 832, 834, 836, 838, 841, 845, 846
Andersen, Roy, artist: ***The Search***

for the First Americans. Sept., 330-363
Anderson, George Edward: Photographs by **220,** 221
Andrus, Cecil D. **61; *Sharing Alaska: How Much for Parks?*** July, 60-65
ANGUS (camera sled) **687**
Animal behavior *see* Prairie dogs; Walruses, Pacific
Animal migration *see* Migration, animal; Migration, bird
Animal transplantation: Puffins **182**
Annenberg, Walter H.: Estate **592-593**
Anopheles (mosquito) 429, diagram **430;** *A. albimanus* **430,** 436
Antelope Valley, Calif.: Flowers **607-608**
Antelope Wells, N. Mex.: U. S. Customs station **484-485,** 488
Anthropology: ***The Search for the First Americans.*** By Thomas Y. Canby. Sept., 330-363
Antilles (liner): Shipwreck **414-415**
Ants: Honey ants **630-631**
Aouderas, Niger 296, 298
Apartments, high-rise: Seoul, South Korea **770-771,** 772, 781, 783, **790-791**
Appalachian Mountains, U. S. *see* Great Smoky Mountains National Park, N. C.-Tenn.
Aquaculture: Oahu, Hawaii **671,** 678
Aquifers: Arizona 628; Egypt 596; Oklahoma 639
Arab nations *see* Bahrain; Yemen, North; Yemen, South
Arab Shipbuilding and Repair Yard, Bahrain **306,** 313, 318-319
"Arabia Felix" 244
Arabian Peninsula: Climate 244, 254; Desert 606; Maps 250, 251; Oil well, first 304, 305; *see also* Bahrain; Yemen, North; Yemen, South
"Arabian wine" 267
Arbuckle Mountains, Okla. 59
Arceneaux, Louis 383
Archaeology: Bahrain: Excavations **324-325,** 326-327; Cape Krusenstern National Monument, Alaska 40; Russell Cave National Monument, Ala. 26; ***The Search for the First Americans.*** By Thomas Y. Canby. Sept., 330-363
Archaeology, underwater: ***Graveyard of the Quicksilver Galleons.*** By Mendel Peterson. Dec., 850-876; Little Salt Spring, Fla. 357, 359, 363, excavation **363; *Yellow Sea Yields Shipwreck Trove.*** Photos by H. Edward Kim. Aug., 231-243
Arctic foxes 766; "blue phase" **765**
Arctic National Wildlife Range, Alaska 733; ***Our Wildest Wilderness: The Arctic Wildlife Range.*** By Douglas H. Chadwick. Dec., 737-769
Acreage 744
Establishment 744, 755
Expansion 768, 769; Map of proposed boundaries 744-745
Hunting and trapping 746, 767
Map 744-745
Visitors, number of 767
Arctic terns 164, 183, **184-185,** Aug. supplement
Arctic Village, Alaska 754
Arden, Harvey: ***The Magic World of Hans Christian Andersen.*** Dec., 825-849
Argentina: Desertification 628; Deserts 604; Paleo-Indian site 341, 360, located 341
Ariyoshi, George R. 667
Arizona: Aquifers 628; Jojoba beans **635;** National park system 1, **46-47,** 85; *see also* Navajo National Monument
Arizona, U.S.S.: Bombing of 664, 667; Hulk **664-665;** Memorial to **665,** 667
Arlit, Niger: Uranium mines 296
Arm rings: Soapstone **292, 293**
Armenta Camacho, Juan 352
Armold, Glenn 873
Armstrong, Tony 875
Arnberger, Leslie **32**
Arrigetch (mountains), Alaska 38
Arrindell, Griffith 410
Arrowroot **408,** 410
Arrows, metal-tipped **754**
Artesia, Calif.: Optical-fiber telephone line 532
Artisans *see* Inadan
Arts and crafts: Leatherworking **206**
Artwork: Ice Age man 337, **350,** 352
Asia: Archaeological sites 336, 342, map 337-338; Deserts 606, 617, map 605-606, *see also* Great Indian Desert; Migrations, prehistoric 342; Paleo-Indians, origin of 330, 336, 342, 351; *see also* Bahrain; Seoul, South Korea; Yemen, North; Yemen, South
Aspen, Colo. 493-494, 499
Assistens Cemetery, Copenhagen, Denmark 848-849
Astor, John Jacob 818
Astoria, Oreg. 818, 821; Population 821
Atacama Desert, Chile 604, 625
Atahir (Inadan) 298
Atchafalaya Basin, La.: ***Trouble in Bayou Country.*** By Jack and Anne Rudloe. Sept., 377-397
Agriculture 378, 384, 385, 393; Fields **384**
Canals and channels 378, 382, 390, 393, 394
Fishing, sport **386,** 389
Fishing industry 378, 381, 389; Crayfish 378, 381, 382, 383, 389
Food chain 382, 390
Forest **384,** 385, 387, 393
Fur trapping 382, 383, 389
Hunting 389, 393
Landowners 378, 394, 396
Levees 389, 390, 393, 394, 396
Map 385
Oil and gas development 378, 382, 394
Productivity 382, 389
Public access 378, 384, 393
Sedimentation 384, 385, 390, 393, 394, 396
Settlers 382-383
Studies 384, 396
Turtle farm 383, 389
Water management 393, 394, 396
Wildlife 377, 382, **386, 388-389,** 396, **397**
Atchafalaya River, La.: Dredging 390; Flow control 378, 384, 396; Interstate 10 bridge 378, **384;** Length 378; Sedimentation 384
Athapaskan Indians: Arctic Village, Alaska 754
Athens, Texas: Hotel **202**
Atlantic City, Wyo. 496, 502
Atlantic Ocean: Cayman Trough exploration 682, 685; Spreading centers 682, 703
Atlantic walruses 569
Audi, Walt 740, 746, 767, 768
Aulaqi, Nasser 264
"Auntie Toothache" (Andersen) 848
Aurora borealis **757,** 767
Auster family **498, 499,** 505
Australia: Desertification 624-625, 628; Deserts **590-591,** 597, 606, 624, **628,** map 606, reclamation 618, **618, 619; *Skylab's Fiery Finish.*** By Tom Riggert. Oct. 581-584
Auth, David 529
Automobiles: Optical-fiber use 516, 518
Autumn—Season of the Smokies. By Gordon Young. July, 142-147
Aviation *see* Aircraft
Awali, Bahrain 305
Azel, Niger: Inadan craftsmen **294-295,** 296

B

Bacchus: Glass decoration **870**
Bachi (Inadan) **290,** 296
Backpacking: Continental Divide region 485, **491,** 492, 496; National park system 31, 32, 36, **66, 68-69,** 126, **133,** 138-139, 141, 142; ***A Walk Across America: Part II.*** By Peter and Barbara Jenkins. Aug., 194-229
Bacteria: Hydrothermal vents 682, 686, 688, 692, **695**
Bada, Jeffrey 351
Baez, Joan 717
Bagzane Mountains, Niger 286, 288, 293
Bahrain: ***Bahrain: Hub of the Persian Gulf.*** By Thomas J. Abercrombie. Sept., 300-329
Aluminum smelters 305, 306,

UMI

312, 313
Banks and banking 300, 301, 304, 310, **310-311,** 312-313
Capital *see* Manama
Dhows 301, 304, 319; Construction 319
Entertainment 312, 313, **313-315**
Facts and figures 309
Falconry 319, 323, **326-327**
Flag **309**
History 302, 304, 312, 319, 321, 323, 328; Ancient 310, 319, 323, 324, artifacts **324,** 327, cemetery 304, 324, **325,** 326-328; Independence 302, 304, 328
Islam 309, 312, 315, 323, 328; Mosques 323, **323**
Name origin 301, 304
Natural gas 305, 306
Oil 301, 302, 304, 305, 306, 309; Discovery 302, 304, 305; Production 305, 306; Wells 304, **306-307,** first 304, 305, number of 305, 306
Pearling 301, 302, 316, 319
Population 302, 309
Refinery 304, 305, **306,** 309
Royal family 328; Emir 315, **321,** 328; Heir apparent **321,** 323
Supertankers 305, 318, 319; Dry dock 302, 304, **306,** 312, 313, 318-319
Women 304-305, **314,** 315, **317, 318,** 329, **329**
Bahrain Petroleum Company 305; Refinery 304, 305, **306,** 309
Bald eagle **212**
Balladonia, Australia: Skylab debris 583
Ballard, Robert D. **685, 699;** ***Return to Oases of the Deep.*** Nov., 689-705
Ballet dancers: Royal Danish Ballet **841**
Balloon, gas-filled: Sawatch Range, Colo. **503**
Bananas: Grenada **419;** St. Vincent **406**
Bandon, Oreg. 806; Chimney sweep **819;** Harbor 802
Banks and banking: ***Bahrain: Hub of the Persian Gulf.*** By Thomas J. Abercrombie. Sept. 300-329
Baptism: St. Vincent **409**
Barbee, Robert D. 29
Barchan sand dunes **609**
Bard, Allan 67, **68, 69, 78**
Barero y Pelaez, Francisco 852, 853, 854
Barnard, Cyril 403, 406, 410
Barnard, Hazel **402**
Barracuda (fish) **255**
Barrier reefs: Oahu, Hawaii 674-675
Barrouallie, St. Vincent 410
Barter Island, Alaska 754, 756
al barussa (ritual of retaliation) 288-289, **289**
Bathtub, Flying (aircraft): Reproduction **374**
Bats: Guadalupe Mountains National Park, Texas 138
Battlestar Galactica: Model **535**
Bayeux, France: Tapestry 441
Bayou Chene (town), La. 383
Bazaars: Manama, Bahrain 304, 305, 316, **316**
Beall, Mrs. 203
Beamer, Martha Mary Ah Ung Kawaiola Fernandez "Billie" 657-658
Bean, Alan L. **581**
Bear Canyon Trail, Guadalupe Mountains National Park, Texas 139
Bearberry, alpine **743**
Bears 125, 128, **508,** 509, 515 *see also* Polar bears
Beasley, David **535**
Beaufort Sea, Arctic Ocean 572, 740, 746, 752, 756, 761; Ice floes **762**
Beauregard, P. G. T. 108, 109, 110
Beaver, Oreg.: Dairy industry 818
Beaverhead Mountains, Idaho-Mont. 511
Bechler River, Wyo. 485, 488
Bed racing: Honolulu, Oahu, Hawaii **666**
Bedeï river, Niger: Tuareg encampment 288
Beebe, Brenda F. 347-348
Beebe, William 682
Beech D 18 (aircraft) **366**
Beefeater (yeoman warder): Tower of London **452**
Been, Virginia 489
Beijing (Peking), China 547, 556
Bell, Alexander Graham 523, 534; Quoted 527
Bell, bronze **870**
Bell Laboratories: Laser **521;** Optical-fiber telephone cable **527;** Photodetector **521**
Bell Telephone: Telephone cables 532, optical fibers, replacement with 533; *see also* Bell Laboratories
Bella tribesmen: Upper Volta **612, 613,** *cover*
Belle River, La. 382
Bellows: Inadan **289**
Belous, Robert 40-41
Benthos, Inc.: Pressure housing for CCD camera **705**
Bequia (island), Grenadines 410, 412
Berg, Carl **698**
Berger, Rainer 351
Bering Sea, Pacific Ocean 761; Walruses 565, 569, 572, **572-573,** 576, 579, 580, migration maps 566-567
Beringia (Bering Strait land bridge) 332, 334-335, **334-335,** 336, 338, 339, 342, 348, 351; Maps 338, 339
Bernice P. Bishop Estate, Oahu, Hawaii: Education of Hawaiians 652, 657; Land holdings 652, 655; Trustees **652-653**
Bernstein, Leonard **51**
The Best of Our Land (National parks). By Gilbert M. Grosvenor. July, 1-2
Betatakin (cliff dwelling), Navajo National Monument, Ariz.: Ruins **81**
Bicentennial, U. S.: Fireworks **36-37**
Bicycles: China 551, **561, 562**
Big Bend National Park, Texas: Drug smugglers 34
Big Spring, Texas: Sandstorm 629
Bighorn sheep **130,** 131, 132, 139
Bikaner, India 617, 624
Biological clock: Birds 156, 165, 181-182, 183, 189
Bird, Junius 351
Bird sanctuaries: England 480; Gateway National Recreation Area, N. J.-N. Y. 87, 89, bird watching program 86, 89, 92, **93;** Hawk Mountain, Pa. 181, **188-189**
Birdbanding: Banders and banding stations 154, 156, **157, 168-169, 174-175,** 178, **186, 187,** 192; Data collected 156, 169, 178, 182, 192-193; Predation studies 749, 766
The "Birdman of Alcatraz" 101
Birds: ***Bird Migration in the Americas; The Americas.*** Aug. supplement; ***Mysteries of Bird Migration.*** By Allan C. Fisher, Jr. Aug., 154-193
Birmingham, England: Medical clinic **427-428**
Birnbaum, Elliot **635**
Bishop, Bernice Pauahi, Princess (Hawaii) 652; Portrait **652**
Bishop, Charles: Portrait **653**
Bishop, Maurice **420,** 422
Bishop Estate *see* Bernice P. Bishop Estate
Bismarck, N. Dak.: Zoo 278
Bison: Yellowstone National Park, U. S. **48**
Bison, Ice Age 330, 332, 335, 336, **339,** 342, 352, 354; Fossils **353**
Biwon, Seoul, South Korea 784
Black bears: National parks **124,** 132, 139, 142
Black Pine Peak, Idaho 226
Black Range Primitive Area, N. Mex. 489
"black smokers" (submarine chimneys) 680, **683, 686, 702;** Temperature 686, 698, 703
Black-tailed prairie dogs 270, 274, 275, **278-279,** 280, 281
Blackfeet Indians 128, 131
Blackfish (pilot whales): St. Vincent 410
Blackford, Tom 721
Blackout: Seoul, South Korea **787**
Blackpoll warbler **168,** Aug. supplement; Migration 156, 164, 170, 171
Blacktail Butte, Grand Teton National Park, Wyo. 148
Blacktail Ponds, Grand Teton National Park, Wyo. 152
Bladderwort **439**
Blair, Edward 495
Blair, Jonathan, photographer: ***Graveyard of the Quicksilver Galleons.*** Dec., 850-876; ***Mysteries of***

Bird Migration. Aug., 154-193
Bligh, William 408
"boat people" *see* Chinese refugees
Boatbuilding: England 459, 461
Boats: Sailboat **802;** Sampans **544-545,** 556; *see also* Fishing boats; *Hickory*
Bob Marshall Wilderness, Mont. **504,** 512-513
Bob's Family Restaurant, Helper, Utah 221
Bodega Bay Marine Laboratories, Calif.: Salt-tolerant tomatoes **626-627**
Bodysurfing: Oahu, Hawaii **673,** 677
Bollen, Kevin **462**
Bomb-burst (aerobatic maneuver) **369**
Bone Canyon, Guadalupe Mountains National Park, Texas 141
Bone working: Engraving **350,** 352, **356;** Knapping 336, 344, 347, 348, 355; Projectile points **341, 353, 359;** Tools **336-339, 341,** 344, 347, **348,** 351, 354, sewing **333, 338,** 342
Bonfires: Midsummer Eve 828, **828**
Bonn (supertanker): Dry-docked **306**
Bonnichsen, Robson 348
Books, NGS: *Research Reports* 1970 298
Boraiko, Allen A.: ***Fiber Optics: Harnessing Light by a Thread.*** Oct., 516-535
Borate mine: Death Valley National Monument, Calif. 59
Bordes, François 333
Borescope: Aviation industry use 533; Weld inspection **532**
Borger, Texas: Gas fields near 196, **211,** 213
Borrell, Pedro 876
Boston National Historical Park, Mass. 42, 44
Bottles, porcelain **242**
Bourn, Keith 496
Bowden, Tracy **851;** ***Graveyard of the Quicksilver Galleons.*** By Mendel Peterson. Dec., 850-876
Boyd, Bill 637
Boyer, David S.: ***Golden Gate—Of City, Ships, and Surf.*** July, 98-105
Bracelet, silver 876, **876**
Brachyuran crabs **681, 682, 688, 689, 690, 691;** Experiments 693, apparatus **693**
Bradbury, Bill 807-808
Bradsby, Ron 489
Brain-cell action: Model **534-535**
Branch, John and William 422, 425
Brass: Clock parts 864, **870**
Brazil: Desertification 628
Breadfruit trees: Caribbean introduction 408
Breezy Point, Rockaway Peninsula, N. Y.: National park system 86-87, **88-91,** 94-95, 96
Bridalveil Fall, Yosemite National Park, Calif. July *cover*
Brimberg, Sisse, photographer: ***The Magic World of Hans Christian Andersen.*** Dec., 825-849
Bristle worms **686, 698,** 698-699
Bristol Bay, Alaska: Walrus hunting, restriction on 580; Walrus research 572, 574
British Army: Hong Kong 720-721, 724 *see aiso* Gurkhas
British Associated State of St. Vincent 400
British Bank of the Middle East, Bahrain: Bronze doors **311**
British Empire 450, 470
Britten, Benjamin 477
Brockbank, Estella Manwaring **220**
Bronchial tube: Coin lodged in **519**
Bronze: Bell **870;** Bronze doors **311;** Chinese bronze 232, **241;** Cooking utensils, 14th-century shipwreck 232; Crucifix **869**
Brooch, gold: Spanish jewelry **866,** 875
Brookings, Oreg. 801
Brooks Range, Alaska 37-38, 744, 745, 755, 756, **760,** 766; Length 740; Map 744-745
Brooks River, Alaska **40-41**
Brown, J. J. 495
Brown, Larry F. 496
Brown, Margaret 495
Brownell, Russell "Doc" 396
Bryan, Alan L. 351, 356, 357
Bryan, Fred 396
Bryce Canyon National Park, Utah **3-5**
Buddhist deity: Statue **231**
Buell, Don Carlos 107, 108, 110
Bull moose **741**
Bullae **870**
Buntings, indigo: Navigation experiments **161,** 182-183
Burgess, Robert and Elizabeth 766
Burial mounds: Bahrain 324, **325,** 326-328
Burkhead, Walter and Wesley **484, 485**
Burton, Nicholas 801
Burton, Phillip 104
Burton Island (icebreaker) 580
Buses: Seoul, South Korea **776-777,** 782-783, 788
Bush pilots: Alaska 36, 38, 40, 42

C

CCD's *see* Charge-coupled devices
Cables, Herbert 96-97
Cactus: Saguaro cactus **636,** infrared photo **637**
Cade, Rowena **477**
Cajuns: Atchafalaya Basin, La. 382-383, 387; Origins 382, 387
Calculators: Light source 518
Caldwell, John and Mary 416, 417
California: Counties secession attempt 804; Deserts **592-593,** 604, **607-608,** 636-637; Irrigation: Salt strangulation 627, 628, drainage for **626,** 627, 629; National park system **12-17, 30-31,** 32, 42, **45,** 49, 59, 64, 89, *cover*, ***A Long History of New Beginnings.*** By Melville Bell Grosvenor. July, 18-29; Paleo-Indian remains **332,** 351; *see also* Golden Gate National Recreation Area; Redwood National Park; Yosemite National Park
California Marine Mammal Center 103
California poppies (wild flowers) **607-608**
Callaghan, James 449, 453
Calligrapher: Seoul, South Korea **778**
Calvin, Melvin **617,** 639
Cambodia *see* Kampuchea
Camels: Breeding: Israel 616; In art **283;** Milk production 251; Niger **282,** 286, 288, **294;** Prehistoric Americas 330, 339, 352, 354, 355, 363; Saddles **282, 294, 295,** makers 282, 284, 286, **294-295,** 296
Cameras, underwater: Camera sled **687;** Motion picture **704;** Video **705**
Camping: National park system 31, 36, 52, 59, 95, 102, **111,** 126, 132, 137, 139, 141, 142, **146,** 147
Canada: Ice Age 333, 334, maps 339-341; Paleo-Indian sites 351, 359, maps 339, 340, *see also* Old Crow River and Basin
Canada geese **192-193**
Canals: China 536, 545, 547
Canby, Thomas Y.: ***The Search for the First Americans.*** Sept., 330-363
Cancer: Detection 516, 529
Cane handles, ivory **860**
Cannibalism: Carib Indians 400
Canning River, Alaska: Cottonwoods near **748-749;** Tributary **742-743**
Cannons: Gettysburg National Military Park, Pa. **54;** Shiloh National Military Park, Tenn. **106-107;** Spanish galleons 852, 864, 865, 867
Canouan (island), Grenadines **400-401,** 412, 414
Canyons: Grand Canyon National Park, Ariz. 1, **46-47;** Guadalupe Mountains National Park, Texas 138, 139, 141
Cape Krusenstern National Monument, Alaska 38, 40
Cape May Point, N. J.: Birdbanding station **186, 187**
Capone, Al 101
Carib Indians 400, 402, 421; Cannibalism 400
Caribbean region: ***St. Vincent, the Grenadines, and Grenada: Taking It as It Comes.*** By Ethel A. Starbird. Sept., 399-425; *see also* Dominican Republic
Caribou 42, 733, **734-736,** 745, 746, 756, 767, *cover;* Migration 746, 754, 761, 767, 768, map showing

UMI

744-745
Carlsbad Caverns National Park, N. Mex. 26, 138
Carnivals: Carriacou **420-421**
Carole Kai Bed Race, Honolulu, Oahu, Hawaii **666**
Carpenter, Gwen **379-381**
Carriacou (island), Grenadines 400, 417, 418, 419; Carnival rehearsal **420-421**; Dancing **424-425**
Carroll, John J. 95
Carter, Jimmy 19, 32, 61, 63, 717, 768
Carvalho, Santos 319
Casas Reales Museum, Santo Domingo, Dominican Republic 875, 876
Castle & Cook, Inc.: Pineapple plantation **674-675**
Castle Combe, England 467
Castles: England **445**, 470, Oct. supplement
Catahoula, La. 390
Cataloochee, Great Smoky Mountains National Park, N. C.-Tenn. 147
Cathedral, Colo. 214
Cats, giant: Ice Age Americas 333, 335, **339**, 347, 355, 363
Cattle, wild: England **466**, 467
Cattle drive: Idaho-Montana **512-513**
Cattle raising: Oregon coast 808-809, **808-809**, 812
Caulfield, Patricia, photographer: ***The Hard Life of the Prairie Dog***. Aug., 270-281
Cavallero, Sal **88-89**
Caves: China 540, **556-557**
Celadon (stoneware) 232, **236-239**; Exports 237, 238
Cemeteries: Ancient 304, 324, **325**, 326-328; Hawaii 667; Sand-engulfed cemetery **600**
Cemetery Ridge, Gettysburg National Military Park, Pa. **54**
Ceramics: ***Yellow Sea Yields Shipwreck Trove***. Photos by H. Edward Kim. Aug., 231-243
Cerebral palsy victims: Recreation program **88-89**
Chaco region, Argentina: Toad from **632, 633**
Chadwick, Douglas H. **767**; ***Our Wildest Wilderness: The Arctic Wildlife Range***. Dec., 737-769; ***Spring Comes Late to Glacier***. July, 125-133
Chadwick, Karen 755, **766**
Chalcopyrite **702**, 703
Chamsil (district), Seoul, South Korea 781, **790-791**
Chang Mee-hi **773**
Chang Min-soo 792
Chapman, Frank M.: Quoted 154
Charge-coupled devices (CCD's) 705; Video camera **684**, 699, **705**
Charleston, Oreg.: Café **800**
Chateaubelair, St. Vincent 410
Chateaubriand, François René de 639
Chen Guang 548
Cheng Tong 721
Chennault, Claire L. 548, 549
Cherokee, N. C.: Tourist attraction **34-35**
Chetco River, Oreg.: Mouth 801
Chicago, Ill.: Encephalitis outbreak (1975) 436; Telephone system: Optical-fiber use 516, 532
Chickasaw National Recreation Area, Okla. 59
Chicken farm: North Yemen **265**, 267
Chihuahuan Desert, Mexico-U. S. 604 *see also* Guadalupe Mountains National Park, Texas
Children: Guilin, China **550-551**, **554-555**, **562**; North Yemen **249**, **261**, **269**; Seoul, South Korea **770-771**, 781, **797**; Timia, Niger **297**
Children's literature *see* Fairy tales
Chile: Desert 597, 604, 625; Desertification 625, 628; Paleo-Indians: Remains **343**, 351, sites 341, 356, 360
Chimney sweep: Bandon, Oreg. **819**; Child dressed as **831**
Chimneys, submarine 682, **683**, **686**, **702**; Temperature 686, 703
Chin Dynasty: China 536, 545, 547
China, People's Republic of: Archaeological sites: Map 337; Border patrols 722, 731; Conflict with Vietnam 716-717; Deserts 606, 617, reclamation 617; ***Guilin, China's Beauty Spot***. By W. E. Garrett. Oct., 536-563; Refugees from 713, 721, 724, **725**, **726-729**, 731
China Mountain, China 721, 731
Chinese ceramics: ***Yellow Sea Yields Shipwreck Trove***. Photos by H. Edward Kim. Aug., 231-243
Chinese Parasol Tree Mountain, China 721, 731
Chinese refugees: ***Hong Kong's Refugee Dilemma***. By William S. Ellis. Nov., 709-732
Cost of transport 713, 716, 717, 719, 722
Crowded conditions **706-708**, 709, **710-711**, 713, **714-715**, 717, **718-719**, 723, 732
Death toll 711, 713, 719
Health hazards 719, 720 *see also* Death toll, *above*
Number of 709, 713
Rations 719
Refugee camps located 713
Transport conditions 709, **710-711**, 713, 716, **718-719**
Chinese Wall (mountain ridge), Mont. **482-483**, 512-513
Ching, Hung Wo **652**
Chingtechen (Jingdezhen), China: Pottery 242
Ch'oe Hyong-gun **234**
Ch'oe Pyong-ho **234**
Cholla: Guadalupe Mountains National Park, Texas **134**
Chou En-lai 548
Christianity: China 547-548, 549; St. Vincent 408, baptism **409**
Chukchi Sea, Arctic Ocean: Walruses 565, **566-567**, 569, **578-579**, 579, migration maps 566-567
Chun Won-ki **773**
Chunk Kam Kut 732
Church, sunken: Jutland Peninsula, Denmark **827**
Church of Jesus Christ of Latter-day Saints: Beliefs 221
Cimarron County, Okla.: Dust storm **638**; Wheat field **638-639**
Citibank: Bahrain branch 310, **310-311**
City Hall Plaza, Seoul, South Korea 770, 796
City of Light (leprosarium): Taizz, North Yemen 267, 268
Civil War, U. S.: ***Echoes of Shiloh***. By Shelby Foote. July, 106-111
Cizhou, China 240
Clams: Ocean-floor oases 680, 682, **687**, 693, 696, **696-697**, meat **696**
Clark, Mac 625
Clark, Tim W.: ***The Hard Life of the Prairie Dog***. Aug., 270-281
Clark, William 511
Clatsop Spit, Oreg. 822-823
Clausen, Carl 357, 359, **363**
Clausen, Phil 806-807
Clay jars: Spanish galleons **859**, **864-865**
Clifton, Union Island, Grenadines 414
Climax Molybdenum Company, Colo. 495-496
Clock: Brass parts 864, **870**
Clovelly, England **481**
Clover, owl's (wild flower) **607-608**
Clovis, N. Mex.: Paleo-Indian site 330
Clovis period 330, 339, 340, 351, 354, 357, 359; Clovis points 330, **340**, **349**, 357, 359, *cover*
Coast Range, Oreg 805; Rainfall 801; Rivers 814; Timber owners 812
Cobalt tumbler **872**
Coble, Darrel **638**
Cockerham, Grady 203
Coconut palms: Volcanic-ash covered **406-407**
Coffee: Bahrain 323, 328; North Yemen 252, 253, 267
Coins, Chinese: Shipwreck, 14th-century 232
Coins, Spanish 860; Gold **860-861**; Silver **852**
Coleman, Stuart 142
Collier, Don 281
Colorado: Ghost town **490-491**; History 214; Mining 488, 493, 495-496; Paleo-Indian sites 354; Salt strangulation **626**; Watersheds, diversion of 493, 496
Colorado-Big Thompson Project 493, 496
Columbia Lightship No. 88 821
Columbia River, Canada-U. S.

822-823; Bar 821-822; Discovery 821; Lewis and Clark expedition 818; Mouth 818, 822, 823; Tributaries 485, 511
Columbine II (balloon): Sawatch Range, Colo. **503**
Columbines (wild flowers) **505,** 515
Columbus, Christopher 400
Commission for Underwater Archaeological Recovery, Dominican Republic 876
Commons, House of (Great Britain) 463, 467
Communes: China **541-543,** 548
Communications: ***Fiber Optics: Harnessing Light by a Thread.*** By Allen A. Boraiko. Oct., 516-535
Communist Party: China 548, 551
Compass: Pocket calculator, 16th-century **871**
Competition Hill, Imperial Sand Dunes, Calif.: Dune-buggy racing 637
Computer paper: Arrowroot used 408
Computers: Archaeological applications 354; Educational use 516, 530, **531;** Optical-fiber data relay 516, 532, 533-534
Conchs: Tobago Cays, Grenadines **411,** 415, 416
A Concise Guide to National Parks. July, 111-123
Concorde (SST): Bahrain, service to 302, 313; New York 86, **92-93**
Coney Island, N. Y.: Aquarium 569
Confucianism: South Korea 788, 793, 795-796
Conservative Party: Great Britain 448, 449, 453, 474
Continental Divide, and region, U. S.: ***Along the Great Divide.*** By Mike Edwards. Oct., 483-515
Cattle raising 489, 511, **512-513**
Exploration 510-511
Glaciers 492, 502, 510
Land use 489, 490, 493
Map 492-493
Mining and prospecting **486-487,** 488, 489-490, 493, 494, 495-496, 502, 512
Precipitation: Rainfall 483, 496, 502, 515; Snow 483, 488, **497,** 515
Vegetation 489, 490, 492, 494, 502, **504, 505, 509,** 510, 513, 515
Water diversion 493, 496
Wildlife 488, 502, **508, 509,** 510, 513, 515
Continental Divide National Scenic Trail, U. S.: ***Along the Great Divide.*** By Mike Edwards. Oct., 483-515
Continental Divide crossings, number of 488, 492
Establishment (1978) 485, 493
Length 485, 488, 492
Lowest point 515
Map 492-493
Markers 483, 489, 493
National forests 485, 488, 489, 490, 502, 509, 512
National parks 483, 485, 488, **494-495,** 496, **500-501,** 505, **509,** 512, 513, **514,** 515
Public lands 502, 505
Railroad-bed segments 488, 493
Road segments 488, 489, 493, 496, 511
States traversed 485
Termini: Northern 505; Southern **484-485,** 488
Wilderness areas 489, 490, 492-493, **504,** 512-513, 515
Continental shelf: Ice Age, exposed during 333-334, 340 *see also* Beringia
Cook, Frederick A. 67
Cook, James 673, 678, 818; Hawaii, discovery of 656
Coos Bay, Oreg.: Lumber industry **810-811,** 814; Sand dunes near **812-813**
Copenhagen, Denmark: ***The Magic World of Hans Christian Andersen.*** By Harvey Arden. Dec., 825-849
Cemetery; 848-849
Little Mermaid statue 836, **847**
Nyhavn **832-833,** 846
Palaces 838, 842, 845-846
Royal Theater 838, **840, 841,** 844, 846
Shrovetide party **831**
Soldiers **842-843**
Tivoli park pantomime **837**
Copening, London **103**
Copper mining: Montana 512; New Mexico **486-487,** 489
Copper River delta, Alaska: Surfbirds **158-160**
Copper wire: Spooled **530**
Coral: Tobago Cays, Grenadines **411**
Corinth, Miss. 106; Civil War 107, 108, 110
Cornell University: Bird-navigation experiments **161-163, 166, 167,** 182, 185, 186-187
Cornett, Terry **800**
Corning Glass Works, Corning, N. Y.: Optical-fiber manufacture 523, 528
Cornwall (county), England 456, 459, 461, 478; Outdoor theater **476;** Tourists 456, 459, 470; Villages 459, 480, **481**
Coronado, Francisco Vasquez 280
Corralling, cattle: Oregon coast ranches **808-809,** 812
Cosmetics: Bahrain **318**
Cosmetics factory: Seoul, South Korea **778**
Cotswold Hills, England 443, 467-468
Cotton fields: Texas **600, 601,** 636
Cottonwoods: Alaska **748-749,** 756
Coulson, Cotton, photographer: ***St. Vincent, the Grenadines, and Grenada: Taking It as It Comes.*** By Ethel A. Starbird. Sept., 399-425
Cousteau, Jacques-Yves 682
Cow, mummified: Western Desert, Egypt 596, **596**
Cowan Brothers Farm, Harbor (town), Oreg.: Easter-lily weeding **821**
Cox, Bob 396
Coyotes 280, **280;** Cattle ranchers and 809, 812
Crabs: Brachyuran **681, 682, 688, 689, 690, 691, 693;** Galatheid **687, 696-697, 702-703**
Crabtree, Donald 333
Craigston Estate, Carriacou (island), Grenadines 419
Crappie **389**
Craven, John 677-678, 679
Crawfish *see* Crayfish
Crayfish: Atchafalaya Basin, La. 378, 382, 383, **389,** 390
Cricket (sport): Grenadines **398**
Crocker-Bedford, Coleman 281
Crosses: Ornaments **286, 287,** 288, **297;** Spanish jewelry **866, 869,** 875
Crosswalk signals: Optical-fiber use 518
Crucifix, bronze: Spanish, 18th-century **869**
Cruxent, José 356, 363
Cuckoo, yellow-billed **154-156,** Aug. supplement
Cuellar family 207
Cumbria (region), England 448-450
Curlew National Grassland, Idaho 226
Curtis P-40E (airplane): Restored **372-373**
Curtsinger, Bill, photographer: ***Learning the Ways of the Walrus.*** Oct., 565-580
Cyana (submersible) 682
Cypress, bald: Atchafalaya Basin, La. 377, 382, 387, 390; Stumps **386-387**

D

DDT: Malaria control 436
Daewoo Electronics, Seoul, South Korea 794
Daggers: Yemen **244,** 252, **254**
Dahr, Wadi, North Yemen **266-267**
Dale, Bruce, photographer: ***The Desert: An Age-old Challenge.*** Nov., 586-639
Dall sheep: Alaska 746, **758-759,** hunting of 746, 759
Dallas, Texas: Restaurant 196, **203,** 207
Dam, ancient: North Yemen 244, 251, **259**
Dammam, Saudi Arabia 309
Dancers and dancing: Carriacou, Grenadines **424-425;** Colorado: Belly dancer **499;** Manama, Bahrain: Disco **313;** Royal Danish Ballet **841,** 844
"Dandelion" (siphonophore) 680, **688, 698**
Danish Royal Guard: Copenhagen, Denmark **842-843,** 845-846

UMI

Dartmoor (region), England 461, 463
Davenport, Lee I.. 518
Davidson, C. B. "Joe" **210, 211**
Deadwood, Oreg.: Cooperative community near 814
Death-horse: Norse myth 828, **848-849**
Death Valley National Monument, Calif. 59
Decanters: Glass 861, **862, 863**
Deer, white-tailed **388**
Del Mar man: Skull **332**
Delta, Colo.: Store window **222**
Demarcation Bay, Alaska 761; Metal drums **755**
Dement family ranch, Sixes, Oreg. 808-809, 812
Demolition: Condemned buildings 96, **96-97**
Demong, Natalie 164
Demonstration: Seoul, South Korea **786, 787,** 796
Deng Xiaoping 547, 552
Dengue fever: Mosquitoes and 429, 430, 438; Symptoms 430, 438; World distribution 430
Denmark: ***The Magic World of Hans Christian Andersen.*** By Harvey Arden. Dec., 825-849
Dentition: American Indians **343;** Europeans **343;** Mongoloids 332, **343;** Paleo-Indians 332, **343,** 351
Denver, John 493, 494
Desert oaks: Simpson Desert, Austraiia **590-591**
Desertification: ***The Desert: An Age-old Challenge.*** By Rick Gore. Nov., 586-639
Deserts: ***The Desert: An Age-old Challenge.*** By Rick Gore. Nov., 586-639
Belts 597, 604; Map 604-606
Expansion 596, 597, 606; Map 604-606
Map 604-606
Population 606
Reclamation 603, 616-617, 618, **618, 619,** 624; Petroleum use 616, **620-623;** Plastics, use of 616, greenhouses 616, **634-635**
Recreational uses 636-637
Sand dunes **586-587,** 594, **594-595,** 596, **598-599, 609;** Reclamation 616, **620-623,** 624
Vegetation 624, 637; Cacti **636;** Flowers **607-608;** Gopher plant **617,** 639; Jojoba plant **635,** 639; Trees **587, 590-591,** 602, 603, **610, 611, 621,** 625, **628-629**
Wildlife 628, **630-633,** 637; Rodents 624, **628, 630-631**
Wind erosion 600, 629, 636
Destroyer, Japanese **664,** 667
Devon (county), England 456, 461, 463, **464-465**
DeVore, Nicholas, III, photographer: ***Along the Great Divide.*** Oct., 483-515
Dhamar, North Yemen 267; Farming valley near **262-263**
Dhana, Wadi, North Yemen: Dam, ancient 244, 251, **259**
Dhani, India 617
Dhows: Bahrain 301, 304, 319
Diamond Head, Oahu, Hawaii **654,** 667
Diamonds: Spanish jewelry **866,** 875
Dickens, Charles 845
Dilmun civilization 310, 319, 323, 324, 328
Dimaj, North Yemen: Village council 264
Dinwoody Glacier, Wyo. 510
Diodes: Light-emitting 518, 532
Dirt bikes: California 636
Disco: Manama, Bahrain **313**
Discovery Bay, South China Sea: Refugee boats 717, 720
Diuktai culture, Siberia 342, 351; Tools and points **352**
Divers and diving: Grenadines **411,** 415, 416; Oahu, Hawaii **665;** *see also* Archaeology, underwater
Doan, Harry 854, 864
Dog heartworm 429, 438
Dog race: Oregon Dune Mushers' Mail Run 813
Dogs: Saint Bernard **215;** Siberian huskies **812-813**
Dole (trade name) 675
Dolls: Seoul, South Korea **784, 785**
Dominican Republic: ***Graveyard of the Quicksilver Galleons.*** By Mendel Peterson. Dec., 850-876
Domino game: St. Vincent **413**
Dorgham, Mohamed Talaat 596
Doubloons, gold **860-861**
Dougaldston Estate, Grenada 425
Douglas fir logs: Oregon coast **810-811,** 812, 814
Drake, Sir Francis 802-803, 818
Dregne, Harold 629
Drought: Niger (1968-1973) 285, 286, 288; Sahel (region), Africa 597, 603, 612, 614
Droxford, England 480
Drug use: North Yemen 252, **252-253,** 260, 267
Drury, William H. 164
Dry docks: Supertankers 302, 304, **306,** 312, 313, 318-319
Dryas: Seed filaments **743**
Dubos, Rene 96
Duet, Lawrence 389
ad-Dukhan, Jabal, Bahrain 305
Dune buggies (cars): Bahrain **300-301,** 304; California 637
Dunes, sand *see* Sand dunes
Dungeness crabs: Oregon coast **805**
Du Pont Company: *Gossamer Albatross* flight sponsor 645
Dura Europus (ruins), Syria: Dust storm **588-589**
Durán, Sam 642, 643, 645, 651
Dust storms: Oklahoma **638;** Syria **588-589;** Texas **208-209,** 629, 636
Dutton, Colo. 354
"The Dying Child" (Andersen) 844
Dykes, Joey 393-394, 396

E

Eagle, bald **212**
Earth: Desert belts 597, 604, map 604-606
Earthquake: Dominican Republic 874-875
East Anglia (region), England 474-475, 477, 480
East Pacific Rise at 21° North: ***Incredible World of Deep-sea Rifts.*** Nov., 680-705
1. ***Strange World Without Sun.*** By the Editor. 680-688
2. ***Return to Oases of the Deep.*** By Robert D. Ballard and J. Frederick Grassle. 689-705
Easter lilies, weeding of **821**
Ebarb, Adron 378
Eberle, John 367
Echoes of Shiloh. By Shelby Foote. July, 106-111
Ecosystems: ***Incredible World of Deep-sea Rifts.*** Nov., 680-705
1. ***Strange World Without Sun.*** By the Editor. 680-688
2. ***Return to Oases of the Deep.*** By Robert D. Ballard and J. Frederick Grassle. 689-705
Edmond, John 701
Edmund, King (England) 475, Oct. supplement
Education: Computer instruction 516, 530, **531**
Edwards, Mike: ***Along the Great Divide.*** Oct., 483-515
Eel fisherman: Funen, Denmark **846**
Egaksrak River, Alaska 768
Egrets: Louisiana 377, **397**
Egypt: ***The Desert: An Age-old Challenge.*** By Rick Gore. Nov., 586-639
Ekaluakat River, Alaska 768
El-Baz, Farouk 594-595
El Capitan, Guadalupe Mountains National Park, Texas **134,** 138-139, 141
El Chico's (restaurant), Dallas, Texas 196, **203,** 207
Elder, Sandy 766
Electric-arc welding: Optical fibers **527**
Elizabeth II, Queen (Great Britain): Bahrain, visit to 328
El Jobo point **341,** 356, 357
Elk **9-11,** 139, 148, 152
Ellis, William S.: ***Hong Kong's Refugee Dilemma.*** Nov., 709-732
Elmsley, Lloyd 637
El Salvador: Malaria in 436
Elverhøj (Elves Hill), Denmark 828, 830
Emeralds: Spanish jewelry **866,** 875
Emlen, Stephan T. 161, 164, 182-183, 185, 186, 187
"The Emperor's New Clothes" (Andersen) 826
Encephalitis: Mosquitoes and 463, 438
Encephalomyelitis, Venezuelan

UMI

equine 437; Colt dying from **437**
Endangered species: Prairie dogs 270, 273, 281
Endoscopes 516, **519,** 529; Attachments 518, 529; Television displays **518, 519**
En Gedi (kibbutz), Israel: Plastic greenhouse **634-635**
Engineer Pass, Rocky Mountains, Colo. **216-217,** 217
Engines: Inspection: Optical-fiber use 516, **532,** 533
England:
British Isles; Medieval England. Oct. supplement
Two Englands. By Allan C. Fisher, Jr. Oct., 442-481
Capital *see* London
Castles **445,** 470, supplement
Churches and cathedrals 443, **465,** 474-475, supplement
Coastal regions **444-445,** 456, **462-463, 478-479**
Economy 450; Gross national product 448; World wars, effect of 450, 453; *see also* Industrial decline, *below*
Fishing industry 459, **462,** 463, **463,** 477, 480
Flag **450**
Government *see* United Kingdom, *outlined*
History 450, 456, 469-470, 475, supplement
Housing, public 468
Industrial decline 448; Contributing factors 443, 445, 448, 450, 453, 456
Inflation 445, 468
Inns 463, **480, 481**
Land use 449; Innovations 456; Map 451
Maps 451, supplement
Moors 450, 461, 463, **464-465,** 469
National parks 456 *see also* Dartmoor; Lake District
Nature reserves 456; Bird sanctuaries 480; Wild cattle **466**
Population 450; Density 468
Religion 450; History of 467, 470, supplement; *see also* Churches and cathedrals, *above*
Resorts 459, 461
Ruins 469-470, 474-475
Schools and universities 474, **474,** supplement
Working class 468, 474, supplement; Labor unions 445, 449, 472, 474
English Channel crossing 585; ***Winged Victory of*** **Gossamer Albatross.** By Bryan Allen. Nov., 640-651
Enteropneust 688
Environmental Protection Agency: Pesticide approval 440
Epic of Gilgamesh 323
Erldunda cattle station, Alice Springs, Australia 624
Erosion: Grand Teton National Park, Wyo. 148, 152; Oregon coast 801; Redwood National Park, Calif. 29; *see also* Wind erosion
Eskimos: Alaska 37-38, 40-41, 42, 63, 64, 756, 761, 762, artifacts **754,** *see also* Inupiats; Walrus hunting 569, 572, 579, 580
Esperance, Australia: Skylab debris 582, **584,** littering ticket for **582**
Estes, Harry 496
Estes, Jim and Caroline 816-817
Europe *see* Denmark; England
Evangeline (Longfellow) 383
Evison, Boyd 142, 147
Ewha Women's University, Seoul, South Korea 778; President **778**
Exercise course, Golden Gate Promenade, Calif. **101**
Experimental Aircraft Association: ***Oshkosh: America's Biggest Air Show.*** By Michael E. Long. Sept., 365-375
Exxon Minerals Co., U.S.A.: New Mexico 489

F

FM-2 Wildcat (aircraft): Restored **372-373**
Fairy tales: ***The Magic World of Hans Christian Andersen.*** By Harvey Arden. Dec., 825-849
Fairy Tales Told for Children (Andersen) 844
Faiyum Oasis, Egypt 595
Falcon, Kelly **386**
Falconry: Bahrain 319, 323, **326-327;** Morocco 323, 327
Falcons, peregrine 181, Aug. supplement; Breeding 323
Falmouth, England 459, 461
Fan: Andersen museum **835**
Fancy, St. Vincent 410; Volcanic-ash covered **404**
Fantastic Voyage (movie) 529
Far-flung Search for the First Americans. By Thomas Y. Canby. Sept., 330-363
Farafra, Egypt 594, 596
Fardan, Ahmad 319
Farms and farming: Guilin, China **541-543,** 543, 548; Oahu, Hawaii 657, **670-671, 674-675,** 675, 677, crops 653, 671, 674, 675, 677
Farnell, Rick 746
Fashion designer: South Korea **773**
Fasi, Frank 667
Faults and faulting:
Incredible World of Deep-sea Rifts. Nov., 680-705
1. ***Strange World Without Sun.*** By the Editor. 680-688
2. ***Return to Oases of the Deep.*** By Robert D. Ballard and J. Frederick Grassle. 689-705
Fay, Francis H. "Bud" 569, 574, 577, 580
Federal Aviation Administration: Air-traffic controllers **371;** "Experimental" category 365
Federal Hall National Memorial, New York, N. Y. **52, 53**
Felkins, Steve 814
Fell's Cave, Chile 360
Ferdinand II, King (Spain) 876
Festival of the Swallows: San Juan Capistrano, Calif. 180
Fiber Optics: Harnessing Light by a Thread. By Allen A. Boraiko. Oct., 516-535
Communications use 516, 523, 532, 533, 534; Telephones 516, 518, 527, 530, 533, cables **527, 530,** diagrams **524-525,** message capacity 525, 532
Computer use 516, 530, **531,** 532, 533-534
Light-amplification devices 518, **533;** Components **528**
Light sources 518, **520, 521,** 523
Medical uses 516, 518, **518-519,** 529; Ulcer treatment 529
see also Optical fibers, *outlined*
Filariasis: Mosquitoes and 429, 430, 436, 438; Symptoms 430, 436, 438; World distribution 430
Filigree, gold: Spanish jewelry **868-869**
Finlay, Carlos 436
Firehole (river), Wyo. 485
Firewood: Desertification 586, 597, 602, 606, 610
Fireworks: Bicentennial celebration **36-37**
The First Americans. By Thomas Y. Canby. Sept., 330-363
Fish hatcheries: Oregon 805
Fisher, Allan C., Jr.: ***Mysteries of Bird Migration.*** Aug., 154-193; ***Two Englands.*** Oct., 442-481
Fishes: Alligator gar **198;** Barracuda **255;** Cod **463;** *Gambusia* **439;** Grenadier fish **694;** Yellowtails **855**
Fishing: Denmark **846;** England **478;** Louisiana **198, 386,** 389; National park system 32, 39, 40, **41,** 87, 92, 94; Oregon coast 804
Fishing boats: Oregon coast 801, 805, 821, 823; Sheds made from **468-469;** Trawlers 459, 477, 480
Fishing industry: Atchafalaya Basin, La. 378, 381, 382, 383, 389; England 459, 463, **463,** 477, 480; North Yemen: Catch **255;** Oregon coast 801, 804, 821
Fishing nets: Hoop net **381;** Storage sheds **462**
Fitzsimmons, Charles 495
Fladmark, Knut R. 350
Flights of Fancy at Oshkosh. By Michael E. Long. Sept., 365-375
Floods and flood control: ***Trouble in Bayou Country.*** By Jack and Anne Rudloe. Sept., 377-397
Florence, Oreg. 228
Florida: Paleo-Indians: Archaeological finds 357, 359, 363, **363**
Flower industry: Oregon coast **820, 821**
Flowerpot, Chinese **236,** 242

UMI

Fluorescence: Scorpion **630**
Flying Bathtub, Ramsey (aircraft): Reproduction **374**
Flying Tigers (squadron) 548-549; Insignia **372-373**
Fokker Dr I (aircraft): Reproduction **366**
Folded Brocade Hill, Guilin, China **538-539,** 556
Folk medicine: *traiteurs* 383
Folklore *see* Fairy tales
Folkstone, England: *Gossamer Albatross* takeoff 640, 642
Fond du Lac, Wis.: Aerobatic competition 368
Food chain: Chemical-synthesis based 688, 692-693
Foote, Shelby: ***Echoes of Shiloh.*** July, 106-111
Forest, Dan **815**
Forest fire: Oregon (1933) 820
Forest-products industry: Oregon 804, 808, 810, **810-811,** 812, 814, 816, 820, decline 805, 820
Fort Baker, Calif.: Marine mammal center 103
Fort Charlotte, St. Vincent 402
Fort Mason Center, Golden Gate National Recreation Area, Calif. 49; Cultural complex **102-103,** 104
Fort Tilden, Rockaway Peninsula, N. Y. 94, **94,** 96; Condemned buildings near, demolition of **96-97**
Fortune, John 722-723, 732
Fortune (fishing boat) 801
Fossil reefs, world's largest exposed: Guadalupe Mountains National Park, Texas 135, 141
Fossils: ***The Search for the First Americans.*** By Thomas Y. Canby. Sept., 330-363
A 14th-Century Cargo Makes Port at Last. Photos by H. Edward Kim. Aug., 231-243
Foxes: Arctic fox 766, "blue phase" **765;** Red fox **750**
Francis, Rell G. **220,** 221
Franciscan friars: Religious medals 869, **869**
Franco, Antonia: Silver bracelet 876, **876**
Franke, Evelyn 227
Franke, Milo 227, 228
Franklin, La. 396
Frederiksberg Palace, Copenhagen, Denmark 838
Friendship Bay, Bequia, Grenadines 410
Frølich, Bruno 326-327
Fryling, Charles 394
Fryrear, Bill 636
Funen (island), Denmark 832, 836; Eeler **846**
Fur-trading post: Astoria, Oreg. 818
Fused fiber-optic components **528**

G

Gaines County, Texas: Wind erosion 636
Gairy, Sir Eric 399, 420, 421, 422, 425
Galapagos Rift, Pacific Ocean: ***Incredible World of Deep-sea Rifts.*** Nov., 680-705
1. ***Strange World Without Sun.*** By the Editor. 680-688
2. ***Return to Oases of the Deep.*** By Robert D. Ballard and J. Frederick Grassle. 689-705
Galatheid crabs **687, 696-697, 702-703**
Galleons: ***Graveyard of the Quicksilver Galleons.*** By Mendel Peterson. Dec., 850-876
Gallium aluminum arsenide lasers **521,** 523
Gambell, Alaska 569, 572
Games: Dominoes **413**
Gar, alligator **198**
Garrett, Lucille **538,** 547, 548
Garrett, W. E.: ***Guilin, China's Beauty Spot.*** Oct., 536-563
Gascoyne River region, Australia 624-625
Gasohol: Hawaii 678
Gasoline, synthetic: Source 617, 639
Gates of the Arctic National Monument, Alaska 38
Gateway National Recreation Area, N. J.-N. Y.: ***Gateway—Elbowroom for the Millions.*** By Louise Levathes. July, 86-97
Gauthreaux, Sidney A., Jr. 165, 169, 171, 185
Geese 171, Aug. supplement; Canada geese **192-193,** 193; Snow geese **737-739,** migration 754, 767
Gehrig, Lou 198, 206
General Motors FM-2 Wildcat (aircraft): Restored **372-373**
General Telephone Company of California 532
George, Steve 874, 875
Georgetown, St. Vincent 410
Georgia, Lowell **766;** Photographer: ***Our Wildest Wilderness: The Arctic Wildlife Range.*** Dec., 737-769
Gerbils, Indian desert 624
Germany: Invasion of Denmark 845-846
Gerster, Georg, photographer: ***The Desert: An Age-old Challenge.*** Nov., 586-639
Gettysburg National Military Park, Pa. **54**
Ghani, Abdul Aziz Abdul 268
al-Ghatam, Sheikh Ali **320**
Ghost towns: Continental Divide region, U. S. **490-491,** 502
Ghosts: England 465, 470, 480
Ghuraz, North Yemen: Jewish community 260, 264
Gibson Desert, Australia 624
Gila National Forest, N. Mex. 489
Gillette, Ned **68;** ***Trekking Around the Continent's Highest Peak*** (Mount McKinley). July, 66-79
Gilliland, Texas: Storm near **208-209**
Gisselfeld Manor, Denmark 830
Glacier (icebreaker) 565
Glacier National Park, Mont. 505, 512, 513, **514,** 515; ***Spring Comes Late to Glacier.*** By Douglas H. Chadwick. July, 125-133; Visitors, number of 767
Glaciers: Wyoming 492, 502, 510
Glamis Store, Imperial Sand Dunes, Calif. 637
Glassware: Spanish galleons 861, **862, 863,** 865, **872-873,** 873, **874**
Gloucester (county), England 443, 467-468
Glover, Bertha **140**
"goabex" 616
Goats: Upper Volta **610**
Goethals, George Washington 419
Going-to-the-Sun Road, Glacier National Park, Mont. 126, **127,** 131
Gold: Spanish jewelry **866, 868-869,** 875
Gold coins: Spanish **860-861**
Gold fields (wild flowers) **607-608**
Gold mining: Colorado 214
Gold ornaments: Manama, Bahrain 304, **316**
Golden Gate Bridge, Calif. **12-13, 98-99,** 103, 104
Golden Gate National Recreation Area, Calif.: ***Golden Gate—Of City, Ships, and Surf.*** By David S. Boyer. July, 98-105
Golf: Seoul, Korea 781, **790**
Golf course: Palm Springs, Calif. **592-593**
Gopher plant **617,** 639; Gasoline from 617, 639
Gore, Rick: ***The Desert: An Age-old Challenge.*** Nov., 586-639
Gorgas, William 436
Gormsbøl, Erling 833
Gossamer Albatross (human-powered aircraft) 585; ***Winged Victory of* Gossamer Albatross.** By Bryan Allen. Nov., 640-651
Cockpit 642, 651; Condensation on walls 642, 645
Designer 640, 642, 645, **645,** 649, 651
Flight path 645, 651; Duration 649, 651; Map 651
Flight sponsor 645
Instruments 642, 651; Failures 643, 645
Kremer prize 640, 645, 649
Pilot 640; Training 643, **644;** Water supply 642, 643, 645, 649; Weight 642, 645
Pusher propeller 642
Speed 642, 645
Weight 642, 645
Wingspan 642, 649; Wing broken **649,** 651
Gossamer Condor (human-powered aircraft) 640, 645
Gouldsbury, Patrick 721
Gouyave, Grenada 422
Grand Canyon National Park, Ariz. 1, **46-47**
Grand Lake, La. 390

UMI

Grand Teton National Park, Wyo. 3, **9-11**; ***Grand Teton—A Winter's Tale.*** By François Leydet. July, 148-152
Grand Valley, Colo.: Salt strangulation **626**
Grant, Ulysses S. 106, 107, 108, 109, 110, 111
Grasslands: Prairie dogs 281
Grassle, J. Frederick **685**; ***Return to Oases of the Deep.*** Nov., 689-705
Graveyard of the Quicksilver Galleons. By Mendel Peterson. Dec., 850-876
Gray, John 807
Gray whales: Migration route 818
Great Britain: Hong Kong 709, 710, 713, British Army in 720-721, 724; Housing, public 468; Oil 448, 472; Oregon territorial claim withdrawn 818; *see also* United Kingdom, *outlined*
Great Divide *see* Continental Divide
Great Divide Basin, Wyo. 483, 496, 502, **510-511**
Great Indian Desert, India-Pakistan **602**, 606, 617, 624; Gerbil problem 624; Reclamation 617, 624; Road workers **594-595**
Great Kills Park, Staten Island, N. Y. 92, 97
Great Plains, U. S.: ***The Hard Life of the Prairie Dog.*** By Tim W. Clark. Aug., 270-281; Paleo-Indian sites 330, 347, 348, 351, 354
Great Smoky Mountains National Park, N. C.-Tenn.: ***Autumn—Season of the Smokies.*** By Gordon Young. July, 142-147
Green, Charles 203
Green River (town), Utah **218-219**
Greenhouses, plastic: Israel 616, **634-635**
Gregory, Bill and Marie **806**
Greig, Max 389-390
Grenada, Windward Islands, West Indies 299; ***St. Vincent, the Grenadines, and Granada: Taking It as It Comes.*** By Ethel A. Starbird. Sept., 399-425
Capital 420, **422-423**
Crops 401, 418, 419, **419**, 422
Dictatorship overthrown (1979) 399, 420, 421, 422, 425
Education 400, 401, 422; Students **423**
History 400, 402, 421, 422
Map 399; Map locating 400
Population 400
Prime Minister **420**, 422; Former 399, 420, 421, 422
Tourist development 410, 420-421
Grenades: Spanish, 18th-century **855**, 867
Grenadier fish **694**
Grenadier Guards: London **442**
Grenadines (islands), Windward Islands, West Indies: Formation 400; History 400, 420; Map 399, located 400; Tourist development 401, 411, 412, 414-415; Water shortage 412, 414-415, 417
Grenville, Grenada: Students **423**
Grey, Robert **582**
Griffin, Donald 185
Grimm, Jacob 826, 847
Grimm, Wilhelm 826
Grimsby, England: Fishing industry 463, **463**
Gris Nez, Cap, France 640, 645, **649-650**; *Gossamer Albatross* landing 649-651
Grizzly bears 125, 128, **508**, 509, 515
Grønbech, Bo 838, 845
Grosvenor, Gilbert H. 1-2, **20**, 21-22, 26
Grosvenor, Gilbert M.: ***The Best of Our Land*** (National parks). July, 1-2
Grosvenor, Melville Bell **28**; ***A Long History of New Beginnings*** (National parks). July, 18-29
Ground squirrels **509**, 515, **765**
Groupers: *Tolosa* wreck site 873
Grove, Noel: ***North Yemen.*** Aug., 244-268
Gruhn, Ruth 354, 356
Guadalupe Mountains National Park, Texas: ***Guadalupe's Trails in Summer.*** By Edward Abbey. July, 135-141
Guadalupe, Nuestra Señora de: ***Graveyard of the Quicksilver Galleons.*** By Mendel Peterson. Dec., 850-876
Armament 864
Cargo 851, 852, 856, 860
Clock 864, **870**
Glassware 861, **862, 863**
Salvors: 18th-century 860; 20th-century 854, 860
Silvermaster 852, 853, 854
Sinking of 852, 856
Survivors 852, 853, 854
Tableware 860, 861, **862**
Wreck: Located 856, 860, map 857
Guam, Territory of: National park 32
A Guide to Parklands. July, 111-123
Guilin, China's Beauty Spot. By W. E. Garrett. Oct., 536-563
Gunnison River, Colo. 213
Gunnison's prairie dogs 274
Guns, bronze swivel 864
Gunsight Pass, Mount McKinley, Alaska **68-69**
Gurkhas (soldiers): Hong Kong 721, 724, **727, 730**
Guzmán, Antonio 876

H

Hachita, N. Mex. 489
Hadrian's Wall, England 469-470
Hainan island, China 719
Hairstyling: Inadan **290-291**, 296
Hajar, North Yemen: Jewish community 264
Halekulani Hotel, Waikiki, Oahu, Hawaii 658
Hales Corners, Wis. 365
Halifax Harbor, Grenada 425
Hall, Ron 207
Halleck, Henry W. 107, 108
Hamana (Inadan) 298
al-Hamdi, Ibrahim 264
Hamidan (Inadan) **295**
Hammond, Jay S. **61**; ***Sharing Alaska: How Much for Parks?*** July, 60-65
Hammond, Peter 453
Hampshire (county), England 480
Hamud, Hadj 268
Han Dong-won 788, 792
Han (ethnic group): China 543, 552
Han River, South Korea 772, 783, 784, **790-791**
The handicapped: Bed racing benefit: Oahu, Hawaii 666; National park system programs 19, **88-89**, 96, 102, 147
Hang glider **105**; Motorized **374-375**
Hanks, Bill 199
Hans Christian Andersen Museum, Odense, Denmark 833, **834**; Exhibits **834, 835**
Hansen's disease 268
Harbor (town), Oreg.: Lily farms **820, 821**
The Hard Life of the Prairie Dog. By Tim W. Clark. Aug., 270-281
Harding, Denis and Janet **452**
Hardy, Edward C. 55
Harington, C. R. 344
Harvey, David Alan, photographer: ***Our National Parks.*** July, 1-152
Haskins, Jack 865, 867
Hassan, Ali bin 319, 323, **326-327**
Hastings, England: Cable TV 533; Net storage sheds **462**
Hatcheries, fish: Oregon coast 805
Hatfield, Frank **100**
Havana, Cuba: Spanish colony 852
Hawaii: Mosquito introduction 429; National park **43**; *see also* Oahu
Hawaii Volcanoes National Park, Hawaii: Volcanic eruption **43**
Hawk Mountain, Pa. 181, **188-189**
Hawks **187, 274-275**, 280, Aug. supplement; Migration 181, 187, 189
Haynes, C. Vance 351, 355
Heartworm, dog 429, 438
Heat probe: *Alvin* **684, 692, 702**
Hebert, Gary 383
Hebert, Robert 383, 389
Hebert, Wally "Preacher" **198**, 204, 206
Hebert, Wilton: Turtle farm 383, 389
Hebert, Wilton, Jr. 382, 383
Heceta Head Light, near Florence, Oreg. **799**
Helicopter cockpit **321**
Helper, Utah 221
Helsingør, Denmark: Midsummer Eve **828**
Hemoglobin: Ocean-floor oases invertebrates 680, 689, 696

Henderson, Douglas 470, 472
Henderson, Colo.: Molybdenum mine 495-496
Henderson, La. 378, 382
Henna: Body painting: Bahrain **318**
Herfordshire (county), England: Jousting **460-461**
Hermit, Colo. 214
Heywood, John 720
Hickel, Walter J. 104
Hickory (salvage ship): ***Graveyard of the Quicksilver Galleons.*** By Mendel Peterson. Dec., 850-876
higa 876
Higashi Ikoma (model community), Japan 533
Higginbotham, Lloyd D. "Red" 383
Higgins, John C. 59
High-rise apartments: Seoul, South Korea **770-771,** 772, 781, 783, **790-791**
Highly Interactive Optical Visual Information System (Hi-OVIS) 516, 530, 533-534
Hikers: Seoul, South Korea **789**
Hiking *see* Backpacking
Hill, Klaus: Home-built aircraft **374**
"The Hill of the Elves" (Andersen) 828, 830
Hillard, Charlie **364**
Himyarites (pre-Islamic people) 251
Hine, Virginia Kyle 378
Hinsdale County, Colo.: History 214
Hi-OVIS *see* Highly Interactive Optical Visual Information System
Hispaniola *see* Dominican Republic
History, U. S.: National parks: ***A Long History of New Beginnings.*** By Melville Bell Grosvenor. July, 18-29; *see also* Civil War
Hobson, Steve **39**
Hodeida, North Yemen 254, 259; Fishing industry **255**
Holden, Dennis 126
Holy Island (Lindisfarne), England **468-469,** Oct. supplement
Holy Order of the Inquisition: Symbol **869**
Homo erectus (early man) 342, 351
Homo sapiens sapiens (modern man) 333
Honey ants: Repletes **630-631**
Hong Kong: ***Hong Kong's Refugee Dilemma.*** By William S. Ellis. Nov., 709-732
Border patrols 720-721, 727
Factory labor: Chinese refugees **720,** 732
Government Dockyard Transit Centre: Refugees **706-709,** 717
Governor 717
History 713, 720, 724
Illegal immigrants 720, 721, 722, 724, **725-729,** 731
Map of: Refugee camps located 713
Population 722
Refugee housing **706-709,** 713, **716,** 720, 723, 732
Refugee population 713
see also Chinese refugees
Honolulu, Oahu, Hawaii 655, 658, **668-669,** 670; Bed racing **666;** Cemetery 667; Crime 664-665; Mayor 667; Sky scrapers 653, **654-655,** 658, **669;** *see also* Waikiki
Honolulu Advertiser (newspaper): Reporter 665, 667
Honolulu International Airport, Oahu, Hawaii 653; Tourists **662-663**
Honolulu Water Board, Oahu, Hawaii: Water-rights dispute 671
Hoobyar, Paul 805
Hookahs (waterpipes) **252-253**
Hookway, Reginald 456
Hoop nets **381**
Hopi Indians: Ancestors, possible 81
Hopkins, David 334
Hopwood, Carol and Rodney **223**
Hormuz, Strait of, Iran-Oman: Oil transport 309
Hornberger, Chuck and Sara 42
Horseback riding: Continental Divide 488, 489, 512, **512;** National park system **87, 90-91,** 102
Horses: Bahrain **320;** England 477, horse-and-dray transport **457,** jousting match **460-461;** Texas: Diseased colt **437**
Horses, prehistoric 330, **339,** 346, 347, 352, 356, 360; Extinction 339, 356, 363
Hotel: Athens, Texas **202**
Howard, Mike 489
Howell, Ann 104
Hruska, Robin **815**
Hudson's Bay Company: Astoria, Oreg. 818
Huey Fong (ship) 722
Hulahula River, Alaska 740, 746
Human-powered aircraft: *Gossamer Condor* 640, 645; *see also* Gossamer Albatross, *outlined*
The Hummer (home-built aircraft) **374**
Hummingbirds: Migration 165, 171
Hunters, Ice Age *see* Paleo-Indians
Hunting: Atchafalaya Basin, La. 389, 393, hunting camp **392;** National parks 38, 39, 42
Hurlbut, Stephen 109
Hurricanes: Grenada 422
Hutton Lake National Wildlife Refuge, Wyo.: Prairie dogs 280
Hydrogen sulfide: Bacteria metabolizing 688, 692, 695
Hydrothermal vents 686, 688, **688, 692;** Submarine chimneys 680, 686, **686, 702,** 702-703

I

IBM: Optical transmitter **520-521**
ITT: Night vision goggles **533**
Ibb, North Yemen 267
Ibrahim, Moawiyah 326, 328
Ibrahim, Mohammad **324**
Ibrahim, Roumer 282, 284
Ice Age (Pleistocene Epoch): ***The Search for the First Americans.*** By Thomas Y. Canby. Sept., 330-363
Continental shelf, exposure of 333-334, 340 *see also* Beringia
Ice-free corridor (North America) 339, 340, 348, 350, 351; Closing of 354
Ice sheets 333, 334, 336, 338, 341, 348, 350, 354; Extent of (North America) 333, 339, 348, 350, 354, maps 338-341
Lakes and ponds created 333, 357, 359
Land bridge *see* Beringia
Maps (ice distribution and vegetation patterns 337-341
Megafauna 333, **337-340;** Extinction 330, 339, 352, 355, 361, 363, causes, question of 330, 363; *see also* Mammoths; Mastodons; Sloths
Meltwater 333, 342, 359
Vegetation patterns: Americas 339, 340
Water levels 357, 359; Diagram **362;** Sea level, lowering of 333, 334, 336, 338, 341
see also Paleo-Indians, *outlined*
Ice floes: Beaufort Sea **762**
"The Ice Maiden" (Andersen) 834
Idaho: Cattle drive **512-513;** Ranches and ranching 196, 223, **224-225,** 226
Ignek Creek, Alaska **742-743**
Illegal immigrants: Hong Kong 720, 721, 722, 724, **725-729,** 731
Illinois Bell Telephone: Optical-fiber testing 532
Image intensifier: Photograph through **533**
Imam Yahya 254
Imams (Islamic leaders): North Yemen 254, 256, 266-267, former palace **266**
Imperial Sand Dunes, Calif.: Dune-buggy racing 637
Imperial Valley, Calif.: Salt strangulation 627, 629, drainage for **626,** 627, 629
The Improvisatore (Andersen) 844
Inadan (people): ***The Inadan: Artisans of the Sahara.*** By Michael and Aubine Kirtley. Aug., 282-298
Craftsmen 282, 284, 286, **292-295,** 296, 298; Compensation 284, 288, 289, 293
Hairstyling **290-291,** 296
Houses 286, **297**
Magic 285, 289, 290-291
Metalwork 282, **283,** 284, 286, **287,** 288, **297**
Origins 285-286
Protocol roles 285, 288, 291, 296
Saddle making 282, 284, 286, **294-295,** 296

UMI

Stone ornaments **286,** 288, **292-293**
Tuareg and 282, 284, 285, 288, 289; Ritual of retaliation 288-289, **289;** Subordinate caste 282, 285
Women 288, **293,** 295, 296
Incense burners: Bronze **241;** Porcelain **242**
Incredible World of Deep-sea Rifts. Nov., 680-705
1. ***Strange World Without Sun.*** By the Editor. 680-688
2. ***Return to Oases of the Deep.*** By Robert D. Ballard and J. Frederick Grassle. 689-705
India: Malaria (1976) 430; *see also* Great Indian Desert
Indian desert gerbils 624
Indian paintbrush (wild flowers) **505,** 510
Indiana Dunes National Lakeshore, Ind. **56-57**
Indians of North America 19, **35,** 41, 45, 59, 63, 64, 104; Anasazi 81-82, 85; Athapaskan Indians 754; Blackfeet 128, 131; Lenni Lenape 94; Tanaina **39;** *see also* Navajos; Paleo-Indians
Indians of South America *see* Paleo-Indians
Infrared light: Communications 523, 525, 527
Infrared photography: Cactus **637**
I-n-Gall, Niger 298
Innocent XIII, Pope: Bullae **870**
Inquisition, Holy Order of the: Symbol **869**
Insects: Agricultural pesticides 138; Alaska 756, **766;** Deserts **630-631;** Population increase 138; *see also* Mosquitoes
International Aerobatic Club: Contest, annual 368
International Business Machines *see* IBM
International Telephone and Telegraph Corporation *see* ITT
Inupiat Eskimos 754, 755, 756, **756**
Invertebrates, red-blooded 680, 689, **689-691,** 696, **697**
Iquique, Chile 625
Iran: Desert: Reclamation 616, **620-623;** Irrigation 616, 621; Islam 308, 312; Oil 305, 308; Revolution (1979) 301, 308
Iraq: Petrochemical industries 308
Ireland, Northern 443, 450
Irrigation: *qanats* 616, 621; Salt strangulation 606, **626,** 627, 628-629, remedies for **626,** 627, 629; Trickle irrigation 603, 616
Irving, William N. 344, **344,** 346
Irwin-Williams, Cynthia 352
Isa, Sultan 319
Isa Town, Bahrain 323; Soccer game **323**
Islam: Bahrain 309, 312, 315, 323, 328; Iran 308, 312; Niger 286, 296; North Yemen 244, 254, 257, 259, 266-267
Islamic State: Map 251
Israel: Agriculture 603, 616, 635, greenhouses 616, **634-635;** Desert reclamation 603, 616
Iverson, Phillip 132
Ivory: Cane handles **860;** Pocket calculator, 16th-century 867, **871**

J

J Storm I (oil rig) 203
Jackson Hole, Wyo.: ***Grand Teton—A Winter's Tale.*** By François Leydet. July, 148-152
Jacksonville, Texas 206
Jacob Riis Park, Rockaway Peninsula, N. Y.: Visitors 19, **90-91,** 94, 95
Jago River, Alaska 746, 753, 761
Jamaica Bay, N. Y. 87, 94, 96
Jamaica Bay Wildlife Refuge, N. Y. **86-87,** 87, 89; Visitors **87,** 89, **93;** Wildlife 86, 87, 89, 93
jambiyya (dagger) **244,** 252, **254**
James, Winnie 569
James Bay, Canada: Bird-marking station **174-175,** 175, **176-177,** 178
Jannasch, Holger W. **695**
Japan: China: Bombing attacks on 540, 548, 549, 552; Forest-product imports 810, 814; Korea: Colonial rule of 772, 775, 779, 788, invasions (16th century) 775, 779; Optical-fiber use 516, 530, 533-534
Japanese: Hawaii 664, 667, 670
Jars: Black-glazed **230, 240;** Celadon **238;** Earthenware **230;** Lacquer-ware **241;** Spanish galleons **859,** 861, **864-865**
Jefferson, Thomas 36, 818
Jefferson, state of: Attempt to form 804
Jeffrey City, Wyo. 488; Uranium 496
Jenkins, Peter and Barbara: ***A Walk Across America: Part II.*** Aug., 194-229
Jenkins, Winky 196, 221, 226
Jet engines: Inspection: Optical-fiber use 516, 533
Jet Propulsion Laboratory, Calif. 585
Jewell, Lubin **392**
Jewelry: Inadan produced 282, **286, 287,** 288, **291, 297;** Spanish galleons **866, 868-869,** 873, 875, 876, **876**
Jiang Qing 552
Jiangxi Province, China: Pottery 242
Jidda, Saudi Arabia: Yemeni population 253
Jingdezhen, China: Pottery 242
John, King (England) 475, Oct. supplement
John F. Kennedy International Airport, N. Y.: Concorde flight **92-93;** Wildlife near 89, 93
Johnson, Lyndon B. 28-29
Johnston, Albert Sidney 108, 109, 110, 111
Jojoba plants **635,** 637; Beans **635;** Lubricant 635, 637
Jones, Merlyn **491**
Jordan, Robert Paul 19; ***Will Success Spoil Our Parks?*** July, 31-59
Joseph, Gregory "Pa-Glean" 419
Jousting: England **460-461**
Jubilee (refugee camp), Hong Kong: Girl **720**
Juma Mosque, Manama, Bahrain: Prayer **322**
Jung Sang-hae 793
Junk, three-masted **232-233**

K

Kaena Point, Oahu, Hawaii: Waves 673
Kaesong, North Korea 772, 775
Kahiltna Pass, Mount McKinley, Alaska 70, 79
Kahuku, Oahu, Hawaii: House **676**
Kahuku Point, Oahu, Hawaii: Resort community 657, 677
Kai, Carole: Bed racing benefit 666
Kaktovik, Alaska 754, 755, 756
Kalahari Desert, Botswana-South Africa 597, 605
Kalashnikov AK-47 (rifle) **248,** 252, 260, 268
Kamehameha I, King (Hawaii) 669
Kamehameha School, Oahu, Hawaii: Singing contest **656, 657**
Kampuchea (Cambodia): Refugees fleeing from 712, 713
Kangaroo rat: Jumping **630-631**
Kanter, Sawson **317**
Kao, Charles K. 516, **525,** 534
Kara Kum Canal, U.S.S.R. 616
Karkheh, Iran: Sand dune reclamation project 616
Karsts: ***Guilin, China's Beauty Spot.*** By W. E. Garrett. Oct., 536-563
kat (alkaloid stimulant) 252, **252-253,** 260, 267; Cost 253, 260; Effects 260
Katmai National Monument, Alaska: Brown bears **40-41;** Fishing **41**
Kawahata, Masahiro 533, 534
Kawkaban, North Yemen: *kat* farmer 260
Kaye, Danny 826
Keeton, William T. 186-187
Keith, Donald H.: ***Yellow Sea Yields Shipwreck Trove.*** Aug., 231-243
Keller, Kathy 131
Keller, Mike 665, 667
Kelly, "Machine Gun" 101
Kent, Ed 419, 420
Kent, Jean 419
Kesey, Ken **814**
al-Khalifa, Sheikh Hamad bin Isa **321,** 323
al-Khalifa, Sheikh Isa bin Sulman (Emir of Bahrain) 315, **321,** 328; Palace 328, gate ornament **321**
Khomeini, Ayatollah 312

Kiangsi (Jiangxi) Province, China: Pottery center 242
Kibbutzim: Israel 616, plastic greenhouse **634-635**
Kiceniuk, Taras 645, 651
Kidney machines: Desalination 639
Kierkergaard, Søren 849
Kijik River, Alaska: Sockeye salmon **65**
Kill sites, prehistoric: North America 330, 339, 347, 351, 352, 354 **358,** 359; South America 355, 356-357
Kim, André **773**
Kim, H. Edward: Author-photographer: ***Seoul: Korean Showcase.*** Dec., 770-797; Photographer: ***Yellow Sea Yields Shipwreck Trove.*** Aug., 231-243
Kim Il Sung 787, 796
Kim jin-soo **779**
Kim Jung-hyun 784
Kim Ki-soong **778**
Kim Okgill **778**
Kim Swoo-Geun **791,** 793
Kim Young-hee **785;** Dolls made by **784, 785**
King, John 275
King, P. J. 467
King, Winston 412
Kingston, St. Vincent 399, 402, 408
Kirby, Earl 402
Kirtley, Michael and Aubine: ***The Inadan: Artisans of the Sahara.*** Aug., 282-298
Kisiju, Tanzania: Malaria symptoms, examination for **431**
Klaver, Ellen 492-493
Klep, Rolf 821
Klick, Dick 512, 513
Klick, Emil 512
Knapping: Paleo-Indians 336, 344, 347, 348, 352, 355, 357, 359; Present-day knappers 333, 348, **352, 355**
Knight, Kenneth L. 428
Knots (birds) 175, **176, 178,** Aug. supplement; Migration 177, 178
Knott, Texas: Cotton fields **600, 601**
Kobuk Valley National Monument, Alaska 41-42
Kona gold (Hawaiian marijuana) 665, 667
Kongakut River, Alaska 756, 761, 767
Kono, Hideto 656, 678
Koo Ja-choon 783, 784, 788
Koolau Range, Oahu, Hawaii 671, 674
Korea, North: Demilitarized zone, tunnels under 787, 796; Guerrillas 779
Korea, South: ***Seoul: Korean Showcase.*** By H. Edward Kim. Dec., 770-797
"Koreagate" 772
Korean War: Armistice 772; Seoul, South Korea 770, 781, 787
Kosa ceremony: Seoul, South Korea **792-793**
Koto, Mike and Mary Lou 227
Kotzebue, Alaska 40-41
Kowloon, Hong Kong 721; Refugees 716
Kowloon Peninsula, Hong Kong: Great Britain's control over 713
Kramer, Gustav 181
Kreithen, Melvin L. 187
Kremer prizes: First human-powered aircraft feats 640, 645, 649
Kristof, Emory **704**
Krotz Springs, La. 384
Kuan-yin (Buddhist diety): Statue **231**
Kueilin, China *see* Guilin
Kuilima Resort Community, Oahu, Hawaii 657, 677
Kuwait 308
Kweilin, China *see* Guilin

L

Labadieville, La. 389
Labiche, Emmeline 383
Labour Party: United Kingdom 448, 449, 453, 467, 474
Lack, David 180
Lacquer ware, Chinese 232, **241**
Lady Ellen Elizabeth (cabin cruiser) 642
Lafayette, La. 378
Lailhacar, Sergio 625, 628
Lake Charles, La.: Tire plant 206
Lake City, Colo. 213, 214, 215; Church **214-215;** School **201**
Lake Clark National Monument, Alaska 42; Fishing near 39; Sockeye salmon **65**
Lake District (region), England 448-450
Lam, S. F. 720
Lamma Island, Hong Kong: Refugees 722
Lampathakis, Yeorgos **535**
Land bridge, Bering Strait *see* Beringia
"The Land of the Best" (NATIONAL GEOGRAPHIC article) 1-2, 21-22, 26, 123
Land use: Alaska 36-38, ***Sharing Alaska: How Much for Parks?*** By Jay S. Hammond and Cecil D. Andrus. July, 60-65; Continental Divide region 488, 489, 493; Redwood National Park, Calif. 29, 64
Landfills: Gateway National Recreation Area, N. J.-N. Y. **86-87,** 89, 94, 96, **96-97**
Land's End, England 456, 459
Landt, Russ 126
Laos: Refugees from 713
Lapland longspurs **749**
Larkin, Timothy 186-187
La Salle, U.S.S. 328
Lasers: Communications: Optical fibers 516, 518, 521, 523, 532; Miniature lasers 518, **520, 521,** 523; Optical-fiber light loss measurement **526;** Preform inspection **522;** Semiconductor 518, **521,** 523; Ulcer treatment 529
Lau Ying Siu 721, 724, **725**
Laughter, Albert **80, 83, 85;** ***Our People, Our Past*** (Navajos). July, 81-85
Laughter, David 82, **83,** 85
Laughter, Mary **83, 84**
Lava: Undersea formations **700, 701**
Lawrence, D. H.: Quoted 440
Leadville, Colo.: Molybdenum mine 495-496
Leakey, Louis S. B. 351
Learning the Ways of the Walrus. By G. Carleton Ray. Oct., 565-580
Leatherman, Howard **809**
Leatherworking **206**
Lechuguilla: Guadalupe Mountains National Park, Texas **139**
Lee, Clara and Tommy 42
Lee Kyung-mo 792
Lee, Sun Keun 788
Lee, Tommy 42
Lejre, Denmark: Iron Age village **848-849**
Lemker, Rick 523, 528
Leopold, Aldo 489
Leprosarium: Taizz, North Yemen 267, 268
Leschley, Herbert 846
Leung family 548, 549
Levathes, Louise: ***Gateway—Elbowroom for the Millions.*** July, 86-97
Lewis, Fielding 378, 396
Lewis, Meriwether 510-511
Lewis, Roger 515
Lewis and Clark expedition 270, 280-281; Columbia River 818
Leydet, François: ***Grand Teton—A Winter's Tale.*** July, 148-152
Li River, China **544-545,** 547, 548, 556, **559, 560**
Light, infrared: Communications 523, 525, 527
Light-amplification devices 518, **533;** Components **528**
Light-emitting diodes: Communications use 518, 532
Light intensifiers *see* Light-amplification devices
Lilies: Easter-lily weeding **821;** Oriental hybrid **820**
Liliuokalani, Queen (Hawaii): Abdication 658
Lime juice: Carriacou, Grenadines 419
Limestone formations: ***Guilin, China's Beauty Spot.*** By W. E. Garrett. Oct., 536-563
Limpets (transmitters) 574, 576, **576**
Limpets, filter feeding 699
Lind, Jenny 847
Lindisfarne (Holy Island), England **468-469,** Oct. supplement
Lindstrom, Bob 488
Ling Canal, China 536, 545, 547
Lipstick: Making of **778**
LISNAVE, Portugal: Arab Shipbuilding and Repair Yard management 313

UMI

Literature *see* Fairy tales
Little Alabama Bayou, La. 393
"Little Claus and Big Claus" (Andersen) 844
"Little Ida's Flowers" (Andersen) 839, 844
"The Little Match-Seller" (Andersen) 826, 844; Illustration **845**
"The Little Mermaid" (Andersen) 826, 836, 845, 847
Little Mermaid (statue), Copenhagen, Denmark 836, **847**
Livestock: Desertification 586, 597, 602, 603, 606, 610, **610, 611,** 618, 625, 628
Lloyd, Mary Elizabeth **229**
Lockley, R. M. 180
Lockwood, C. C., photographer: ***Trouble in Bayou Country.*** Sept., 377-397
Locusts: Upper Volta **628-629**
Logan Pass, Glacier National Park, Mont. 126, 131
London, England 453, 459, 480, Oct. supplement; City streets **442-443, 446, 447, 457;** Population 450, 468, 480; Waterfront **454-455**
Long, Michael E.: ***Oshkosh: America's Biggest Air Show.*** Sept., 365-375
Long, Bayou, La. 382
Long Beach, Calif.: Optical-fiber telephone line 532
A Long History of New Beginnings (National parks). By Melville Bell Grosvenor. July, 18-29
Longquan (district), China: Ceramics **238-239**
Longspurs, Lapland **749**
Lopes, Antonio Machado 318-319
Lord, Peter 344
Lorenzo, José Luis 354
Los Angeles, Calif.: National park system 19, 32, 42, 89
Louisiana *see* Atchafalaya Basin
Louisiana State University 389; Center for Wetland Resources 393
Lowell, Mass. 44
Lowestoft, England 477
Lufkin, Texas 206
Lulu (catamaran) 685, **685, 699**
Lungch'üan (Longquan) district, China: Ceramics **238-239**
Lyman, Richard **652**
Lynx **765**
Lyons, Ted **198**

M

Mabbutt, Jack 625
Macao 719, 723; Refugees 712, 713
McConnell, Shawn **201**
MacCready, Paul B. 585, **645;** ***Winged Victory of* Gossamer Albatross.** By Bryan Allen. Nov., 640-651
Mace (spice): Grenada export **419**
Machete **418**
McKegg, Tom 819, **819**
MacKenzie Delta, Canada 754
McKinley, Mount, Alaska: ***Trekking Around the Continent's Highest Peak.*** By Ned Gillette. July, 66-79
McKittrick Ridge, Guadalupe Mountains National Park, Texas: Trail 139, 141
McLaren, Zepherin 419
MacLehose, Sir Murray 717, 731
MacNeish, Richard S. 352, 355-356
Madden, Robert W., photographer: ***Which Way Oahu?*** Nov., 652-679
Madera-Font, Ruby **484**
Madrona tree: Guadalupe Mountains National Park, Texas **138**
Magic: Inadan 285, 289, 290-291
The Magic World of Hans Christian Andersen. By Harvey Arden. Dec., 825-849
Magma: Ocean floor 680, 700, 701
Magnetic field: Bird orientation and 156, 165, 185-187, 189, 191
Mahdavi, Mehdi 616
Mahugh, Irv **374**
Mai Po marshes, Hong Kong 721, **726-727**
La Maison Cadien (restaurant), St. Martinville, La. 389
Malamud, Bernard 801
Malaria: Distribution map 430; Eradication of 429, 430, 436; Mosquito transmission 428, 429, 430, 431, 436, parasite causing **431;** Transmission mechanism **430**
Malaysia: Refugees 712, 713
Mammoth Hot Springs, Yellowstone National Park, U. S. **27**
Mammoths 330, 332, 335, **339,** 342, **346,** 351, 352, 354, 359, 363; Fossils 333-334, **345,** 346, 347, 354
Man-powered aircraft: *Gossamer Condor* 640, 645; *see also* Gossamer Albatross, *outlined*
Man, prehistoric *see* Paleo-Indians
Manama, Bahrain 302, 304; Aerial view **302-303;** Banks **310-311,** 312; Dhow construction 319; Disco **313;** Gold ornaments 304, **316;** Markets 304, 305, 316, **316,** 319
Mancebo, José 873
Mandaville, Jon 253, 260
Manhattan, N. Y. **58;** Telephone cable 532, replaced by optical fibers 533
Manta Fledgling II (aircraft) **374-375**
Manuel, Rickie **662**
Mao Tse-tung 536, 547, 552
Mapleton, Oreg. 814, 816
Maps:
  Aïr (region), Niger 285
  Alaska: Parklands 62-63, 744-745
  Arabian Peninsula 250, 251; Oil fields 250, 308-309
  Arctic National Wildlife Range, Alaska 744-745
  Asia: Archaeological sites, Ice Age 337-338
  Atchafalaya Basin, La. 385
  Bahrain 309
  Bering Sea, Pacific Ocean: Walrus migrations 566-567
  Beringia (land bridge) 338, 339
  British Isles; Medieval England. Oct. supplement
  Chukchi Sea, Arctic Ocean: Walrus migrations 566-567
  Continental Divide Trail, U. S. 492-493
  Dominican Republic, locating wrecks of the *Guadalupe* and *Tolosa* 857
  East Pacific Rise, Pacific Ocean, located 688
  England 451; *Medieval England; British Isles.* Oct. supplement
  English Channel: Flight path of *Gossamer Albatross* 651
  Galapagos Rift, Pacific Ocean, located 688
  Gateway National Recreation Area, N. J.-N. Y. 87
  Glacier National Park, Mont., located 126
  Golden Gate National Recreation Area, Calif. 102
  Grand Teton National Park, Wyo., located 148
  Great Smoky Mountains National Park, N. C.-Tenn., located 142
  Guadalupe Mountains National Park, Texas, located 135
  Hong Kong 713
  McKinley, Mount, Alaska: Trek around 70
  Navajo National Monument, Ariz., located 82
  North America: *The Americas; Bird Migration in the Americas.* Aug. supplement; Archaeological sites, Ice Age 337-341
  Oahu, Hawaii 659
  Oregon coast 804
  Persian Gulf, showing major oil fields, pipelines and refineries 308-309
  Seoul, South Korea 774
  Shiloh National Military Park, Tenn., located 108
  South America: *The Americas; Bird Migration in the Americas.* Aug. supplement; Archaeological sites, Ice Age 337-341
  Southeast Asia, showing refugee routes from Vietnam 712
  United States: National park system 112-122; West: Prairie dog range 273, trans-America hike 196-197
  Wisconsin, locating Oshkosh 367
  World: Deserts 604-606
  Yellow Sea, locating shipwreck site 234
  Yemen, North 250
Marchi, John 94

Margaret, Princess (Great Britain) 412
Marib (ancient city-state) 244, 251, 260; Ruins near 244, 251, **258, 259**
Marib, North Yemen 244, 248, **261**
Mariculture: Hawaii 678
Marijuana: Hawaii 665, 667
Marine Mammal Protection Act (1972) 573, 580
Markets: Manama, Bahrain 304, 305, 316, **316,** 319
Marsh, Sir Richard 456, 467
Marshall, Bob 513, 761
Martin, Homer and Ruby **200**
Martin, Leonard and Virginia 820
Martin, Paul S. 363
Martin, Ronald 461
Mary Queen of Scots: Statue **459**
Masanto, Winston 422
Mason, Frank 402, 408
Massachusetts: National parks 26-27, 42, 44
Masterworks of the Wild — a Portfolio From Our National Parks. July, 3-17
Mastodons 335, **339-340,** 352, 356, 359, 360, 363; Fossils 333-334, **350,** 352, 356, **359**
Mastropaolo, Joseph 643
al-Masudi 319
Matchmakers: Seoul, South Korea 795
Mather, Stephen 26
Matthews, Geoffrey 180
Mattson, Dick 128
Mauna Ulu, Hawaii Volcanoes National Park: Eruption **43**
Mauritania: Capital 597, 614, **615;** Desert **586-587,** 597, 602, **610, 614;** Desertification 597, 602, 610; Farming **614;** Firewood gathering **610;** Nomads 597, 614, **614;** Population 597; Rain 597, 639
Mayberry, Keith 629
Mead, J. R. 281
Meadowcroft Rockshelter, Pa.: Depicted **360-361;** Excavation methods 354-355, 361; Finds 354, 355, projectile point **341**
Medallions, gold: Spanish jewelry **866, 868-869,** 875
Medals, religious: Spanish galleons 869, **869,** 876
Medicine and health: ***Mosquitoes, the Mighty Killers.*** By Lewis T. Nielsen. Sept., 427-440
Medicine pipe bundle: Blackfeet Indians 128
Medieval England *see* England
Melville, Herman: Quoted 580
Memphis, Tenn. 106; Civil War 108
Menuhin, Yehudi **51**
Merced River, Yosemite Valley, Calif.: Swimmers **33**
Mercury (metal): ***Graveyard of the Quicksilver Galleons.*** By Mendel Peterson. Dec., 850-876
Metrejean, Claude 383
Mexican prairie dogs 274, 281
Mexican workers: Cowan Brothers Farm, Harbor (town), Oreg. **821**
Mexico: Deserts 604, 636; Paleo-Indian sites 351, 352, 354, finds **339, 350,** 352, 354
Mexico-United States border: U. S. Customs station **484-485,** 488
Meyer, Amy 104
Mid-Oceanic Ridge 680, 703
Middle East *see* Bahrain; Yemen, North; Yemen, South
Midkiff, Frank **653**
Midsummer Eve: Denmark 826, 828, **828**
Migration, animal 153, 752-753; Caribou 746, 754, 761, 767, 768, map showing 744-745; Gray whales 818; Ice Age 335, 337, 339, 354; Migrating species 170; Walruses 566, 569, 572, maps showing 566-567
Migration, bird:
Bird Migration in America; The Americas. Aug. supplement
Mysteries of Bird Migration. By Allan C. Fisher, Jr. Aug., 154-193
Air currents, use of: Thermals 181, **188;** Winds 156, 164, 165, 181, **189**
Altitudes, flight 164, 171
Altitudinal migration 170, supplement
Autumnal migrations 156, 164-165, 170, 172, 175, 177, 181; Numbers migrating 156, 165
Day fliers 156, 171, 180
Distances flown 156, 164-165, 177, 178, 185
Flying hours, nonstop 164, 165, 170
Flyways 164-165, 170, 177, 181, 187, 193; Maps 172-173, 177, supplement
Hazards 169, 172, 180; Fatality rate 172
Night fliers 156, **161,** 165, 169, 171, **171,** 172, 182, 183
Overwater flights 164-165, 170, 177, 180, supplement
Premigratory behavior 170, 176-177
Speeds traveled 164, 165, 171-172
Spring migration 156, 161, 172, 180
Stimuli regulating 156, 161, 170, 171
Tracking methods: Banding 154, 156, **157,** 169, 175, **178,** 180, 182, 186, 192-193; Dye marking **174-178,** 175, 176; Radar 164, **164,** 170, 171, **171**
Migrations: ***The Search for the First Americans.*** By Thomas Y. Canby. Sept., 330-363
Miller, Edward "Ted" 576
Miller, Stewart E. 532
Milner Pass, Rocky Mountain National Park, Colo. 500
Mina Sulman, Bahrain 309, 328
Mines and mining: Colorado 214, 488, 493, 495-496; Montana 512; New Mexico **486-487,** 489-490; Wyoming 496, 502
Ming Dynasty: China 547-548
Minneapolis Veterans Administration Medical Center, Minneapolis, Minn. **518-519,** 529
Minnow **439**
Miracles of Fiber Optics. By Allen A. Boraiko. Oct., 516-535
Miss Universe contest (1979): Skylab debris **584**
Missionaries: China 548, 549; Hawaii 656, 673
Mississippi: Civil War 107, 108, 110
Mississippi River: Floodways *see* Atchafalaya Basin
Mitchell, Andrew 625
Mitchell, Oreg. 227
Mocha: Name origin 267
Mochanov, Yuri A. 342, 351
Models: Brain-cell action **534-535;** Space ships **535**
Mojave Desert, Calif. 604; Flowers **607-608**
Molybdenum ore: Colorado 493, 496
Monarch butterflies: Crookes Point, Staten Island, N. Y. 92
Money changers: Sana, North Yemen **254**
Mongolia: Archaeological sites: Map 337; Neanderthal man 342
Mongoloid race: Physical traits 332, dentition 332, **343**
Montana: Paleo-Indian finds **349,** *cover; see also* Glacier National Park
Monte Desert, Argentina 604
Moon, Sun Myung 772
"Moonies" 772
Moore, Alan 312-313
Moose **741**
Moray eel: *Tolosa* wreck site 874
Morgan City, La. 378, 394, 396; Flooding 385, 396
Morganza, La.: Water-control structure 378
Morganza Floodway, La. 385
Morlan, Richard E. 348, 350
Mormons: Utah 220, 221, 226
Morocco: Falconry 323, 327
Morrison, R. I. G. **174,** 175, 176-177, 178, **178, 179**
Mosques: Bahrain 323, **323**
Mosquitoes 756, **766;** ***Mosquitoes, the Mighty Killers.*** By Lewis T. Nielsen. Sept., 427-440
Anatomy 428, **430,** 432, **434-435**
Control of 438, **438, 439,** 440; Pesticide resistance 430, 436, 438
Disease transmission 427, 428, 429, 430, 436, 437; Diagram showing **430;** *see also* Dengue fever; Dog heartworm; Encephalitis; Filariasis; Malaria; Yellow fever
Eggs 426, 428, 429, 432, **432**
Fatalities caused by 428, 429,

438 *see also* Disease transmission, *above*
Female bite **426,** 427, 428, 432, 434
Habitats 428, 429
Larvae 428, 429, 432, **433, 438, 439**
Mating 428, 434
Nectar-feeding 427, 428, **428,** 429, 440
Pupa **433**
Species and subspecies, number of 426, 428
Weight 428
Mounds, burial: Bahrain 324, **325,** 326-328
Mount McKinley National Park, Alaska: ***Trekking Around the Continent's Highest Peak.*** By Ned Gillette. July, 66-79
Mountain climbing: National parks 49, 52, 126, 132; *see also* McKinley, Mount, Alaska
Mountain goats: Montana **509,** 513
Mountains, limestone *see* Karsts
Mousehole, England 459; Inn **480**
Moya Pons, Frank 876
Mudd, Margaret **471**
Muhammad (prophet) 251, 266
Muharraq Island, Bahrain: Airport 302; Causeway 302, **303,** 304
Muir, John 18, 26, 145
Mukyodong (district), Seoul, South Korea 782
Mule deer: Glacier National Park, Mont. **130**
Mule trip: Grand Canyon National Park, Ariz. **46**
Mules **747,** 766, 767
Mulhern, Thomas D. 436
Mummified cow **596**
Murray, Len 456, 472, 474
Museum of Man, San Diego, Calif.: Paleo-Indian skull **332**
Museums: Santo Domingo, Dominican Republic 875, 876; Seoul, South Korea **774-775,** 779
Mushrooms, puffball **504**
Musical instruments: Drums 288, 291, 296
Musk-oxen **752-753,** 767
Mussels: Galapagos Rift **688,** 689, **692-693,** 695, bristle worms and **698,** 699
Mustard seeds: Mosquito control **438**
Mustique (island), Grenadines 412, 417
Myong-dong (district), Seoul, South Korea 781
Myrtle Point, Oreg. 808; Logging firm 812, 814
Mysteries of Bird Migration. By Allan C. Fisher, Jr. Aug., 154-193

N

Nabataean civilization 603
Najib, Mohammed 319
Nakata, Seiyu **670**
Nakomtenga, Upper Volta 602
Nam San (hill), Seoul, South Korea 772
Namib Desert, South-West Africa 597, 605
Narrow-gauge railroad 492
National Aeronautics and Space Administration *see* Skylab
National Audubon Society: Puffin transplantation **182**
National Bank of Bahrain, Manama, Bahrain **311,** 312
National Elk Refuge, Wyo. 148, 152
National forests, U. S.: Continental Divide Trail 485, 488, 489, 490, 502, 509, 512
NATIONAL GEOGRAPHIC (NGM):
Articles: Human-powered flight 640; National parks 1-2, 21-22, 26, 28, 123; Nuclear energy 299; Undersea research 682
National Geographic Society (NGS):
Board of Trustees 26, 27
Books *see* Books, NGS
Committee for Research and Exploration 27
Grants: *Guadalupe* and *Tolosa* preservation 875; Paleo-Indian research 332; Prairie dog research 270; Redwoods 26, 27-28; Russell Cave, Ala. 26; Undersea exploration 682, Underwater video camera 682, 705
Sequoia trip (1915) **20-22,** 26
Skylab debris **584**
Television special: Brain-cell action model **534-535**
National Memorial Cemetery of the Pacific, Honolulu, Oahu, Hawaii 667
National Museum, Seoul, South Korea 779
National park system, U. S.: ***Our National Parks.*** Photos by David Alan Harvey. July, 1-152
Acreage, total 113
Atlas guide to national parks 112-122; Abbreviations and symbols 113
Budget (1946 and 1979) 36
Camping and campgrounds 31, 36, 52, 59, 102, 126, 132, 137, 139, 141, 142, **146,** 147; Forbidden 137; Opposition to 95; Reservation system 52, 59, 113, 142
Controversial issues 34, 36, 41, 60-64, 89, 94, 95, 96-97, 135; Litigation 55, 63
Establishment (1916) 22, 26
Expansion 2, 18, 19, 32, 36, 60-64, 113
Future 36, 44, 49, 59, 61, 63, 64, 113; Map 62-63
Handicapped, use by 19, **88-89,** 96, 102, 147
Indian lands 19, 45, 81-85, 113, 128
Maps 112-122
Overcrowding 27, **30-31,** 31-32, 34, 36, 40, 52, 142, 152; Solutions 52, 55
Performing arts 49, **50-51,** 51, **52,** 102, 113
Pollution and litter 27, **28-29,** 40, 52, 55, 59, 86, 94; Cleanup program 55
Sites, number of 111, 113
Urban parks 2, **12-14,** 19, **23-25,** 25, 32, 34, 36, 42, 44, 49, 86-105
National parks, U. S.: Continental Divide National Scenic Trail 483, 485, 488, **494-495,** 496, **500-501,** 505, **509,** 512, 513, **514,** 515; First 27, 32; NATIONAL GEOGRAPHIC articles 1-2, 21-22, 26, 28, 123; ***Our National Parks.*** Photos by David Alan Harvey. July, 1-152
National recreation areas *see* Gateway National Recreation Area, N. J.-N. Y.; Golden Gate National Recreation Area, Calif.; Oregon Dunes National Recreation Area, Oreg.
National trail system *see* Continental Divide National Scenic Trail
National wildlife refuges *see* Arctic National Wildlife Range
Natural gas: Atchafalaya Basin, La. 378, 394; Bahrain 305, 306; Texas 196, 211, 213
Navajos (Indians): ***Our People, Our Past.*** By Albert Laughter. July, 81-85; World War II: Radio transmitters 490
Navigation, bird:
Bird Migration in the Americas; The Americas. Aug. supplement
Mysteries of Bird Migration. By Allan C. Fisher, Jr. Aug., 154-193
Auditory cues 156, 165, 189
Celestial navigation 156, 161, 164, 165, 181-182, 183, 189
Directional bias 169, 170, 181, 182-183, 187; Innate 181, 182, 185; Learned 181, 183
Experiments **161-163,** 181-183, **190, 191;** Displacement **164,** 180, 181, 186-187
Homing 156, 164, 180, 185, 186-187, 189, 191
Landmark navigation 156, 169-170, 180-181, 185, 189, supplement
Magnetic field-gravity orientation 156, 165, 185, 186-187, 189, 191
Olfactory orientation 187, 189
Sensory orientation 156, 165, supplement; Symbolized **154-155, 156;** *see also* Pigeons
Time factor 156, 165, 181-182, 183, 189
Needle, bone: Paleo-Indian **333**
Negev Desert, Israel 603, 616; Reclamation 603, 616, plastic greenhouse **634-635**

UMI

Nematode worm: Filariasis agent 436
New Iberia, La. 378
New Jersey *see* Gateway National Recreation Area
New Mexico: Mining **486-487**, 489-490; Paleo-Indian site 330; Rocky Mountains **197**, 213; U. S. Customs station **484-485**, 488
New Orleans Baptist Theological Seminary, New Orleans, La. 199
New South Wales, Australia: Desert reclamation **618, 619**
New Valley (project), Egypt 596, 599
New York, N. Y.: National park system **52, 53, 58** *see also* Gateway National Recreation Area
Newfoundland: Bird nesting grounds 164, **182**
Newman, Robert 44
Newmarket, England 477
Newport, Oreg. 804, 818
Niamey, Niger 286
Nichols, Willis 417
Nielsen, Kay: Illustrations by **830, 842**
Nielsen, Lewis T.: ***Mosquitoes, the Mighty Killers***. Sept., 427-440
Niemi, Dutch and Mo 818
Niger: ***The Inadan: Artisans of the Sahara***. By Michael and Aubine Kirtley. Aug., 282-298
Night blindness: Aid for 518
Night-vision devices 518, **533**; Components **528**
"The Nightingale" (Andersen) 826, 836, 838, 847
Nikiema, Salam 602
Ningpo (Ningbo), China 232
Nisbet, Ian C. T. 164
Nixon, Richard 95
Noatak National Monument, Alaska 37
Nobel Prize for chemistry: Winner (1961) **617**
Nokhra, India 617
Nomads *see* Tuareg
Nooruddin, Nooruddin 312
Norse myth 828, 832, 836, 849
North America: Maps: ***Bird Migration in the Americas; The Americas***. Aug. supplement; ***The Search for the First Americans***. By Thomas Y. Canby. Sept., 330-363; Vegetation patterns, map of 339-340
North Carolina: Tourist attraction **34-35**; *see also* Great Smoky Mountains National Park
North Korea *see* Korea, North
North Sea, Atlantic Ocean: Fishing 463, 477; Oil 441, 448, 472
North Shore, Oahu, Hawaii: Surfing 673
North Slope, Alaska 744, 745, 746, 753, 755, 766, 767; Cottonwoods **748-749**
North Spit, Coos Bay, Oreg.: Sand dune 814
North Yemen *see* Yemen, North
Northern lights **757**, 767
Northumberland (county), England **444-445**, 469-470
Nouakchott, Mauritania: Aerial view **615**; Gardening **614**; Population 597, 614; Refugees 597, 614, **614**, shantytown **615**
Nova Scotia, Canada: Paleo-Indian site 359
Nuclear energy: NATIONAL GEOGRAPHIC article 299
Nuclear reactors: Inspection: Optical-fiber use 516
Nunamiut (Eskimos): Subsistence hunting 38
Nuñez, Lautaro 360
Nutmeg: Grenada **419**, 422, 425
Nuuanu Pali (escarpment), Oahu, Hawaii **668-669**
Nyhavn, Copenhagen, Denmark **832-833**, 846
Nyssa, Oreg. 227

O

Oahu, Hawaii: ***Which Way Oahu?*** By Gordon Young. Nov., 652-679
  Agriculture 657, **670-671**, 671, **674-675**, 675, 677; Crops 653, 671, 674, 675, 677
  Aquaculture **671**, 678
  Building boom 655, 656, 657, 674, 675, 677
  Climate 659, 667
  Crime 664-665, 667
  Development plans 656-657, 658, 678, 679
  Economy 656, 678-679 *see also* Tourism, *below*
  Environmentalists 657, 671, 674-675
  Ethnic diversity 652, 658, 667, 670
  History 656; World War II 664, 667
  Landowners 657, 658, 679; Largest 652; Map 659
  Maps 659; Landownership 659
  Marijuana 665, 667
  Mountains 658, **668-669**, 671, 674
  Surfing 673, 677; Bodysurfing **673**, 677; Windsurfing **660-661**
  Tourism 653, 655, 656, 663, 679; Tourists **662-663**, 667, 670
  Volcanoes, extinct **654**, 658, 667
  Water-rights dispute 671, 677
  see also Honolulu
Oaks, desert: Simpson Desert, Australia **590-591**
Oases, ocean-floor:
  Incredible World of Deep-sea Rifts. Nov., 680-705
    1. ***Strange World Without Sun***. By the Editor. 680-688
    2. ***Return to Oases of the Deep***. By Robert D. Ballard and J. Frederick Grassle. 689-705
  Bacteria 682, 686, 688, 692, **695**; Studies 695
  Fauna discovered **686-688**, **698**, 698-699
  Food chain 688, 692-693
  Hydrogen sulfide 682, 688, 692, 695
  Hydrothermal vents 686, 688, **688, 692** *see also* Submarine chimneys, *below*
  Invertebrates, red-blooded 680, 689, **689-691**, 696, **697**
  Lava formations **700-701**
  Life zones: Diagram **686-688**
  Minerals 686, 688, 701, 702-703, **703**
  Submarine chimneys 680, **683, 686, 702**; Temperature 686, 698, 703
Obsidian tools 333, 354, **355**
Ocean floor: Rifting 701, diagram **688**
Oceanography:
  Incredible World of Deep-sea Rifts. Nov., 680-705
    1. ***Strange World Without Sun***. By the Editor. 680-688
    2. ***Return to Oases of the Deep***. By Robert D. Ballard and J. Frederick Grassle. 689-705
Oceans: Sedimentation rate 700
Ochoco Mountains, Oreg. 227
Odense, Denmark 832-833, 836, 848; Andersen museum 833, **834, 835**
Odin (Norse deity) 832
Of City, Ships, and Surf (Golden Gate National Recreation Area, Calif.). By David S. Boyer. July, 98-105
Off-road vehicles (ORV's): California 636-637
"Offshore" banking units: Bahrain 310, 312
Ogallala aquifer, Okla. 639
Oh My God Hot Springs, Calif. 636
Ohio: National parks 19, 32, 89
Oil: Abu Dhabi, United Arab Emirates 308; Alaska 60, 61, 745, 755; ***Bahrain: Hub of the Persian Gulf***. By Thomas J. Abercrombie. Sept., 300-329; North Sea 441, 448, 472; Texas 196, 211; World reserves 309
Oil-drilling platform: Section **394-395**
Oil drums: Demarcation Bay, Alaska **755**
Oil industry: Atchafalaya Basin, La. 378, 382, 394
Oil wells: Bahrain 304, 305, 306, **306-307**
Oklahoma: Dust storm **638**; Wheat field **638-639**
Old Crow River and Basin, Canada: Airview **344-345**; Excavations **344-345**, 346-348, finds **331, 336, 338, 339**, 344, **344, 345**, 346-348, 351; Paleo-Indian sites 336, 344, located 338, 339
Olds, Sheldon **273**
Oliver, Carroll 393
Olney, Texas: Leatherworker **206, 207**

Olton, Alfonso 408, 410
Omaha Beach, Normandy, France 441
Oman: Revolution 309
Omeri, Mohamed 267
Omeri Poultry Farm, Sana, Yemen Arab Republic **265,** 267
Only a Fiddler (Andersen) 844
Opelousas, La. 393
Optical fibers: ***Fiber Optics: Harnessing Light by a Thread.*** By Allen A. Boraiko. Oct., 516-535
Coating 516, 528
Cross section **522**
Manufacture **522,** 523, 528; Cost 522
Size 516, 528
Splicing **527**
Structure **522,** 523, 528
Total internal reflection 528
Transparency 523, 528
see also Fiber optics, *outlined*
Optical transmitter **520-521**
Orange Hill Estates, St. Vincent **402-403,** 410; Palm trees, ash covered **406-407**
Oregon: History 802-803, 804, 808, 818; Population 805; Rivers 801, 804, 805, 808, 814 *see also* Columbia River; Unemployment 805; Voters 801, 804; Westward movement 817, 818; *see also* Oregon coastal regions, *outlined*
Oregon coastal regions: ***Oregon's Lovely, Lonely Coast.*** By Mark Miller. Nov., 798-823
Artists 805-806
Beaches 804, 805, 813, 822
Cattle raising 808-809, **808-809,** 812
Coast 801, 823; Length 804; *see also* Beaches, *above*
Coastal climate 804, 805, 820; Fog 803, **822-823;** Rainfall 799, 801, 820
Dairy industry 818
Economy 805, 808, 810, 812, 814
Erosion 801
Export 810, 814
Farmland 804, 808, 814, 818
Fish 801, 804, 805; Hatcheries 805
Fishing and fishermen 801, 804, 818, 821; Boats 801, 805, 821, 823
Flower industry **820, 821**
Forest-products industry 804, 808, 810, **810-811,** 812, 814, 816, 820, decline 805, 820; Logging roads 801
Forests 804, 805, 808, 812, 820; Dune-buried 814; Forest fire (1933) 820
Harbors and ports 802, 805, **810-811**
Highways and roads 804, 805; Lack of 801
Jetties, rock 801, 822-823
Land values 804, 808, 820
Mountains 804, 808, 809, 812 *see also* Coast Range, Oreg.
Ocean: Access 804, 805; Breakers 801, **802-803, 807, 816-817,** 821, 823; Swells 801, **802-803,** 804, 821, 823; Temperature 801
Population 805
Sand dunes **812-813,** 813, 814
Sea stacks 801
Sheep raising 801, 809, 812
Shipwrecks 801, 821
Storms 801, 803, 805, 814, 822, 823; Warnings 821, 823
Unemployment 805
Wildlife 809, 812, 814, **816-817**
Oregon Dune Mushers' Mail Run (dog-team race) 813; Practice **812-813**
Oregon Dunes National Recreation Area, Oreg. **813,** 814
Oregon Trail: South Pass segment 492, 502; Westward movement 817
Organization of Arab Petroleum Exporting Countries: Supertanker dry dock **306**
Ørsted, H. C. 845
Osaka, Japan: Suburban computer center 516, **531,** 533, 534
Oshkosh, Wis.: ***Oshkosh: America's Biggest Air Show.*** By Michael E. Long. Sept., 365-375
Ouajoud, Niger 298
Our National Parks (United States). Photos by David Alan Harvey. July, 1-152
Our People, Our Past (Navajos). By Albert Laughter. July, 81-85
Our Wildest Wilderness: The Arctic Wildlife Range. By Douglas H. Chadwick. Dec., 737-769
Ouray, Colo. 221
Oursi, Upper Volta 603
Owl's clover (wild flower) **607-608**
Oxford, England **474-475**
Oysters: Oahu, Hawaii **671**

P

PC-8B (research submersible) 576
P-40E, Curtiss (aircraft): Restored **372-373**
Pacific Ocean *see* East Pacific Rise at 21° North; Galapagos Rift
Pacific walruses *see* Walruses, Pacific
Paddies: China **541-543**
Paget, Steven **815**
Palaces: Seoul, South Korea **774-775,** 779
Paleo-Indians: ***The Search for the First Americans.*** By Thomas Y. Canby. Sept., 330-363
Cave dwellers 354-355, 360; Depicted **360-361**
Dates, framework of 336, 351; Maps, coded 338-341
Dogs, domesticated 342, 348, 361
Ethnic origins, search for 330, 336, 342, 351
First traverse into North America, question of 330, 332, 336, 342, 344, 351, 363
Hunters 330, 344, 350, 354; Depicted **334-335, 346-347, 356-357, 360;** Overkill (theory) 330, 363
Ice Age animals and: Depredation of game 330, depicted **356-357;** Game 335, 338, 339, 342, 344, 346, 347, dressing of **336,** 344, 346, 352, 354, 355; Megafaunal extinction 330, 337, 341, 356, 361, 363
Occupation of the Americas 330, 332, 338, 340, 341, 344, 350-351, 355, 356, 359, 361, 363; Advancement pattern (theories) 352, 363; Routes, possible 332, 336, 339, 340, 348, 350; Traveling modes, possible 332-333, 342, 350
Projectile points: Bone **341, 353, 359;** Stone 330, **340, 341,** 347, **348,** 351, **352,** 354, 356, 357, 359, 360, 363, *cover*
Racial origins 332, 343, 351
Shelter 335, 342; Depicted **334;** *see also* Cave dwellers, *above*
Skeletal remains **331, 332, 343,** 351
Tools, quality of 333, 344, 345, 355; Resharpened 339, 354; *see also* Bone working; Stone working
Weapons *see* Projectile points, *above*
Palm Island, Grenadines 416-417
Palm Springs, Calif.: Estate **592-593**
Palm trees: Volcanic ash covered **406-407**
Pantomime: Tivoli park, Copenhagen, Denmark **837**
Paper cuttings: Hans Christian Andersen **835, 836, 839**
Papi, Floriano 187
Paramore, Edward: Quoted 767
Parasite: Malaria **431**
Parish, John **366**
Park Chung Hee 784; Assassination attempt (1968) 779
Parker, Jeanette 87, 89
Parks: Seoul, South Korea 784; *see also* National parks
Parks Grandeur in Pictures. Photographic portfolio. July, 3-17
Pearl Harbor, Oahu, Hawaii: Japanese destroyer **664,** 667; Naval base 667, 670; World War II 664, 667
Pearling: Bahrain 301, 302, 316, 319
Pearls: Spanish jewelry **866,** 875
Pease, Asa **206, 207**
Pease, Melanie **207**
Peking (Beijing), China 547, 556
Pennell, Ernie and Betty Jo 213
Pennell, Viola 228, **229**
Pennsylvania: National parks 26, 49, **54;** Paleo-Indian site *see* Meadowcroft Rockshelter
Penttila, Terry 132
Penzance, England 459
Peregrine falcons 181, Aug. supplement; Breeding 323
Perez Montás, Eugenio 876

UMI

Perranporth beach, England **478-479**
Perseverance Friendly Society: Grenadines 412
Persian Gulf: ***Bahrain: Hub of the Persian Gulf.*** By Thomas J. Abercrombie. Sept., 300-329
Perth, Australia: Miss Universe contest (1979) **584**
Peru: Paleo-Indian site 340, 341, 355-356
Pesticides: Effect on bats 138; Mosquito control 430, 436, 438, 440
Peters, Lake, Alaska **768-769**
Peterson, Mendel: ***Graveyard of the Quicksilver Galleons.*** Dec., 850-876
Petit Nevis Island, Grenadines 412
Petit St. Vincent (island), Grenadines 415, 417
Petite Mustique (island), Grenadines 417
Petroleum: Sand-dune reclamation project 616, **620-623;** *see also* Natural gas; Oil
Phelps Dodge Corporation: Copper mine **486-487,** 489
Philip V, King (Spain): Portrait **852**
Philippines: Chinese refugees 712, 713, 717
Photodetector **521**
Photographic enlarger **529**
Photography, infrared: Cactus **637**
Photography, ultraviolet: Scorpion **630**
Photography, underwater *see* Cameras, underwater
Photophone 523, 534
Piccard, Jacques 682
Picturephone: Optical-fiber signal transmission 532
Pierce, Wayne **371**
Pierre Part, La. 382, 383, 389
Pierrot (theatrical character): Pantomime **837;** Paper cutting **836**
Pigeons: Experiments with 165, **166, 167,** 186-187, 189, **190, 191;** Hearing 156, 165, 167, 189; Homing ability 186-187, 191; Olfactory orientation 187, 189; Vision 156, 165, 167, 187, 189
Pig's head: *Kosa* ceremony **792**
Pika **746**
Pikimachay, Peru: Paleo-Indian finds **340, 341,** 355
Pilgrimage Through Two Englands. By Allan C. Fisher, Jr. Oct., 442-481
Pillow, porcelain **242**
Pimentel, Bolivar 875
Pine, Pamela 268
Pine Springs Cafe, Guadalupe Mountains National Park, Texas **140**
Pineapples: Oahu, Hawaii 653, 671, 674, 675, harvesters **674-675**
Pirogues **376**
Pistol, 18th-century **860-861**
Pitts Specials (aircraft): Air Show **364, 369**
Pittsburg Landing, Tenn.: Civil War 107, 108, 110
Plaquemine, La.: Cajuns 383
Plastics: Desert reclamation 616, greenhouses 616, **634-635**
Plate tectonics:
Incredible World of Deep-sea Rifts. Nov., 680-705
1. ***Strange World Without Sun.*** By the Editor. 680-688
2. ***Return to Oases of the Deep.*** By Robert D. Ballard and J. Frederick Grassle. 689-705
Platt, Joseph 323
Playing cards: Hans Christian Andersen Museum **835**
Pleistocene Epoch *see* Ice Age
Pliny the Elder 319
Plywood industry: Oregon coast 814; Closing 805
Poberezny, Paul 365
Poberezny, Tom 365
Poi 671, 677
Point Reyes National Seashore, Calif. 102-103, 104
Polar bears **763;** Walruses and 565, 577, **578**
Pollination: Mosquitoes 428
Pollution: Federal lands 488, 492, 493, cleanup 493, control 496; Oregon coast 805, elimination 810, 814; *see also* Air pollution
Pompeii worm **686, 698,** 698-699
Pony (Korean-made car) 777
Poole, Jonas 566
Poppies, California (wild flowers) **607-608**
Porcelain, Chinese 232, **242-243**
Port Orford, Oreg. 805, 808
Portuguese: Bahrain 306, 313, 318-319, occupation of 328
Potters: Bahrain **324**
Powell, John Wesley 496
Powers, Roger 351
Powers, Oreg. 805, 808
Prairie dogs: ***The Hard Life of a Prairie Dog.*** By Tim W. Clark. Aug., 270-281
Burrows 270, **271-273,** 273, **276-277,** diagram **277;** Colonies 270, 274, 275, 276, 280, 281
Communication 270, 274, 275, 276
Diet 278, 280, 281
Displays 275, **279**
Endangered species 270, 273, 281
Extermination of 270, 281
Hibernation 274, 280
Pups **271,** 275, 277, **278-279,** 280; Newborn **278**
Range 270; Map 273
Social structure 270, 275, 276, 278
Territorial behavior 275, 276
Prakash, Ishwar 624
Pratt, Wallace E. 141
Prehistoric cultures *see* Paleo-Indians
Prentiss, Benjamin 108, 109
Presidio, San Francisco, Calif. 104
Prieto Vicioso, Esteban 876
"The Princess on the Pea" (Andersen) 826, 844, 847
Prineville, Oreg. 227
Project FAMOUS: NATIONAL GEOGRAPHIC article 682
Projectile points: ***The Search for the First Americans.*** By Thomas Y. Canby. Sept., 330-363
Prudential Insurance Company of America: Resort community 657, 677
Prudhoe Bay, Alaska: Oil 745, 755
Ptarmigans, rock **750**
Pueblo, Mexico: Paleo-Indian site near 352
Pueblo Bonito, N. Mex. 26
Pueblo Indians: Possible ancestors 81
Puffins **182, 183,** Aug. supplement
Pugak Mountain, Seoul, South Korea 779
Pulp mills: Japan 810, 814
Punchbowl, Honolulu, Oahu, Hawaii 667

Q

Qabus, Sultan (Oman) 309
qanats: Iran 616, 621
Qatar: Oil 308
Qattara Depression, Egypt 596; Depth 597
Quail, mountain: Altitudinal migration 170
Quang Yen, North Vietnam: Refugees from 716, 717
The Quickie (aircraft) **374**
Quicksilver *see* Mercury

R

RCA: Charge-coupled device video camera **705**
Rabbits: Australia 624, **628**
Raccoon **388**
Racehorses: Bahrain **320**
Rackham, Arthur: Illustrations by **839, 845**
Radar: Birds tracked by 164, 170, 171
Radiocarbon dating: Paleo-Indian sites 330, 332, 344, 348, 354, 355, 356, 357
Radiotelemetry: Birds 186, 191; Walruses 574, 576, transmitters 574, 576, **576**
Ragab, Abdulla 259
Rainbow: Bridalveil Fall, Yosemite National Park, Calif. July *cover*
Raja, Sumaya 268
Rajasthan (state), India: Desert 617, 624; Gerbil problem 624
Ram, Moda 617
Ramdhanny, L. L. 422
Ramsey, Jack **225**
Ramsey, Jason **201**
Ramsey Flying Bathtub (aircraft): Reproduction **374**
Ranches and ranching: Colorado 214; Idaho 196, 223, **224-225,** 226; Oregon coast 808-809, **808-809,** 812

Raney, Dave 657, 674-675, 677
Ras Kathib, North Yemen: Port 259
Rattlesnakes **211**; Sidewinder **633**
Rawdon, Blaine 651
Rawlinna, Australia: Skylab debris 582, 583, **584**
Ray, G. Carleton: ***Learning the Ways of the Walrus***. Oct., 565-580
Raymer, Steve, photographer: ***Bahrain: Hub of the Persian Gulf***. Sept., 300-329; ***North Yemen***. Aug., 244-268
Reclamation: ***The Desert: An Age-old Challenge***. By Rick Gore. Nov., 586-639
Red Devils (aerobatic team) **364, 369**; Members 365
Red-eared sliders (turtles) 383, 389
Red foxes **750**
"The Red Shoes" (Andersen) 826, 838
Redwood Creek, Calif. 28, 29
Redwood National Park, Calif. **15-17**, 27-29, 64
Redwoods: California **15-17**, 26, 27-29, 100, 102
Reed, Walter 430, 436
Reed Flute Cave, Guilin, China **556-557**
Reforestation: Iran **621**
Refugees: Sahel drought 597, 614, **614**, shantytown **615**; *see also* Chinese refugees
Religious medals: Spanish galleons 869, **869**, 876
Repletes (ants) **630-631**
Respirometer **684, 694**
Restaurant: Seoul, South Korea **780-781**
Restaurants, fast-food: London, England **446**; Sana, North Yemen **264**
Retinitis pigmentosa (eye disease): Victims, aid for 518
The Rewards of Walrus-watching. By G. Carleton Ray. Oct., 565-580
Rhinoceros, woolly (extinct) **338**, 342
Rice fields: China **541-543**
Richthofen, Manfred von 367
Rifts, ocean-floor *see* East Pacific Rise at 21° North; Galapagos Rift
Riggert, Tom: ***Skylab's Fiery Finish***. Oct., 581-584
Risberg, Barbara 805
Rising Star (TV spaceship): Model **535**
Rissa (Tuareg) 288-289
Rituals: Inadan 288-289, **289**
Rock: Lichen-encrusted **764**
Rock ptarmigans **750**
Rockaway Peninsula, N. Y.: National park system 86-87, **88-91**, 94, **94**, 95, 96, **96-97**
Rockefeller, Laurance S. 27
Rockwell International: Space shuttle engine **532**
Rocky Mountain National Park, Colo.: Highway **500-501**; Wildlife 496, **509**
Rogue River, Oreg. 804; Float trips 805
Roller skates: Seoul, South Korea **770-771**
Romans: England 469-470, Oct. supplement
Rookery: Steller's sea lions **816-817**
Roosevelt, Theodore 18, **18**
Roseate spoonbill **7-8**
Rostropovich, Mstislav **51**
Rothstein, Arthur: Photograph by **638**
Round Island, Alaska: Walrus research 574, **575**, 576
Rowand, Keith 449-450
Rowell, Galen **68, 69**, 70, 79
Royal Danish Ballet: Rehearsal **841**; School 844
Royal Theater, Copenhagen, Denmark 838, **840, 841**, 844, 846
Rub al-Khali (Empty Quarter), Arabian Peninsula 594
Rubin, Cyrus 529
Rudloe, Anne and Jack: ***Trouble in Bayou Country***. Sept., 377-397
Ruiz, Russell 393
Rush, Dale **627**
Russell, John 746
Russell, Linda **52**
Russell Cave National Monument, Ala. 26
Rutan, Burt: Aircraft, home-built **374**
Ruth, Babe 198, 206
Ruth Gap, Mount McKinley, Alaska: Ice cliff near **77-79**
Rutter, Nathaniel W. 350
Ryan, William Fitts 97

S

Saba (ancient kingdom) 244, 251, 259, 260; Map 251
Sabine River, La.-Texas 206
Sacalait (fish) **389**
Sadah, North Yemen: Market **248**
Saddle making: Inadan 282, 284, 286, **294-295**, 296
Sadlerochit River, Alaska 753
Saguaro cactus **636**; Infrared photo **637**
Sahara (region), Africa: ***The Desert: An Age-old Challenge***. By Rick Gore. Nov., 586-639; ***The Inadan: Artisans of the Sahara***. By Michael and Aubine Kirtley. Aug., 282-298
Sahel (region), Africa: ***The Desert: An Age-old Challenge***. By Rick Gore. Nov., 586-639; *see also* Inadan
Saidou (Tuareg chief) 603
St. Andrew's Anglican Secondary School, Grenada: Students **423**
Saint Bernard (dog) **215**
St. Elmo, Colo. **490-491**
St. George's, Grenada 420, **422-423**
St. Ives, England 459, 470
St. John Island, Virgin Islands 27
St. Lawrence Island, Alaska 569, 580
St. Martinville, La. 383, 389
St. Vincent, Windward Islands, West Indies 299; ***St. Vincent, the Grenadines, and Grenada: Taking It as It Comes***. By Ethel A. Starbird. Sept., 399-425
Capital 399, 402, 408
Crops 401, 403, 406, **406, 408**, 410, 412
Economy 399, 402, 412
Education 400, 401
History 400, 402, 408
Map 399; Map locating 400
Population 400
Tourist development 401, 420-421
Volcanic eruption (1979) 399, 404, **405**, 406; Crops damaged 399, 406, **406-407**, 410
Sakhir, Bahrain: Airstrip, abandoned **314-315**
Saleh, Ali Abdullah **248**, 256
Salishan Spit, Oreg. **806-807**
Salm, Rodney **576**
Salmon: Alaska **38-39, 65**; Oregon coast 801, 804, 805
Salmonella: Turtles, pet 389
Salt: Crop strangulation 606, **626**, 627, 628-629, remedies **626**, 627, 629
Salt Lake City, Utah 221
Salt-tolerant crops 616, **626-627**, 627
Salvage: ***Graveyard of the Quicksilver Galleons***. By Mendel Peterson. Dec., 850-876
Samaná Bay, Dominican Republic: Shipwrecks *see Guadalupe, Nuestra Señora de; Tolosa, Conde de*
Sampans: China **544-545**, 556
San Francisco, Calif. 19, **23-25** *see also* Golden Gate National Recreation Area
San Juan Capistrano, Calif.: Swallows 170, 180
Sana, North Yemen **246-247**, 248, 254, **254, 264**; Airport 248; Fast-food restaurant **264**; Money changers **254**; Poultry farm **265**, 267
Sand dunes: Egypt 594, 596, **598-599, 609**; Great Indian Desert **594-595**; Iran 616, reclamation of 616, **610-621**, 621, **622-623**; Mauritania **586-587**; Oregon coast **812-813**, 813, 814
Sand yachting: England **479**
Sandberg, Carl 26
Sandoval, Arthur 490
Sandoz, Nicole 597
Sandpipers 171, 172, **174-177**, Aug. supplement; Chick **749**, 766; Migration 175, 177, 178
Sandy Hook, N. J.: National park 87, 94, 95
Sangli, Jean-Paul 602
Santa Fe Railway: Coal deposits owned by 490
Santa Rosa Island, Calif.: Paleo-Indian site 351

UMI

Santiago, Chile: Slums 628
Santiago, Order of: Cross **866,** 875
Saoit, Pascual **679**
Sar, Bahrain: Archaeological site near 326
Saudi Arabia 308, 309, 312; Agriculture 264; Islam 312; North Yemen, aid to 244, 256, 259; Oil 305, 308, 309; South Korean contractors 779
Sauer, Franz and Eleonore 182, 183
Sauteurs, Grenada 425
Save-the-Redwoods League 26
Savji, Soni Dulbhji 304
Sawatch Range, Colo.: Balloon crossing **503**
Sawmills: Oregon coast 808, **810-811,** 814, closing 805
Scenic Guilin Links China's Past and Present. By W. E. Garrett. Oct., 536-563
Schaap, Bob 488
Schaeffer, John 40-41
Schafer, Harry 873
Scharfe, Don 126
Schechter, Joel 603, 616
Schillizzi, Chris 92, 94
Schlief, Dale 864
Schwarz, Frederick P., Jr. 489
Scorpion **630;** Fluorescence **630**
Scotland: Public housing 468; Relations with England 443, 469, 470, devolution 441, 448, 450, 472
Scrimshaw 574
Sea anemones **692**
Sea Lion Caves, near Florence, Oreg. **816-817**
Sea stacks: Oregon coast 801
Seabirds **182-185,** Aug. supplement; Migration 164, 180, 182, 185, 193
Seafloor oases *see* Oases, ocean-floor
Seals: Bahrain, ancient 324, **324,** 327
Seamstress: Guilin, China **554**
The Search for the First Americans. By Thomas Y. Canby. Sept., 330-363
Seaton, Fred 755
Seif sand dunes **609**
Sejong Cultural Center, Seoul, South Korea 779
Semiconductor lasers 518, **521,** 523
Senegal River, Africa: Drought (1978) 597
Senior citizens: National park system programs 51, 94, 96, 102
Seoul, South Korea: ***Seoul: Korean Showcase.*** By H. Edward Kim. Dec., 770-797
Air pollution 770, 784
Blackouts 787, **787**
Children **770-771,** 781, **797**
Clean-up crusade 782, **782-783,** 784, 788
Confucianism 788, 793, 795-796
Demonstration **786, 787,** 796
Dress, traditional **784, 785, 788**
Economy 770, 772, 777, 782, 793-794
Education 792-793; School uniforms **783;** Universities 772, 778, 792, entrance exams 792
Food and drink **780-781,** 782
High-rise apartments **770-771,** 772, 781, 783, **790-791**
History 772, 775, 779, 788; Founding 772; Japanese rule 772, 775, 779, 788; Korean War 770, 772, 781, 787, 788
Industry 777, **778,** 794
Map 774
Mayor 783, 784, 788
Museums **774-775,** 779
Name meaning 772
Night clubs 782, 793, **794-795**
Palaces **774-775,** 779
Population 772; Density 782
Skyscrapers 770, 772, **774-775, 787**
Traditional values 795-796
Traffic **776-777,** 777, 782, 783; Police **777**
Transportation **776-777,** 777; Buses **776-777,** 782-783, 788; Subway 783, 791, construction 783, **790-791**
Westernization 781-782, 788, 794-795
Women **776,** 777, **777,** 778, **778**
Workers **778, 792-793,** 793-794, **794-795;** Wages 793, 794
Seoul National University, Seoul, South Korea 792
Sequoia National Park, Calif. 26
Sequoias: Calif. 1, **18, 20-22,** 26
Serpulid worms **692-693**
Seton, Ernest Thompson 281
Seven Star Park, Guilin, China **546-547,** 548
Seville, Spain: Spanish colonial archives 860, 865
Seward, William H. 64
Sha Tau Kok, China-Hong Kong 721, 731; Barbed-wire fence **730**
Sham Chun River, China-Hong Kong 721
Sham Shui Po (refugee camp), Hong Kong 732
Sham Shui Po Temporary Transit Centre, Hong Kong **716**
Shantytown: Nouakchott, Mauritania **615**
al-Sharif Saud Hassan Mohtam 244, 248, 251, 268
Sharing Alaska: How Much for Parks? By Jay S. Hammond and Cecil D. Andrus. July, 60-65
Shaw, Larry Don **600, 601,** 636
Shearwaters (birds) 164, 180, Aug. supplement
Sheba, Queen of 251, 259
Sheenjek River, Alaska **747,** 766, 767
Sheep raising: England 449, 450, 463, 465, 470; Oregon coast 801, 809, 812
"The Shepherdess and the Chimney Sweep" (Anderson): Characters **831;** Illustration **830**
Sherman, William Tecumseh 106, 107-109, 110
Shia Muslims: Bahrain 312, 315; Iran 308, 312; North Yemen 266
Shiloh, Tenn.: Civil War casualties 106, 109, 110
Shiloh National Military Park, Tenn.: ***Echoes of Shiloh.*** By Shelby Foote. July, 106-111
Shinn, Richard L. 732
Shipbuilding: Bahrain 301, 319
Shipping: Wood-products 810, **810,** 814
Ships *see Hickory*
Shipwrecks: ***Graveyard of the Quicksilver Galleons.*** By Mendel Peterson. Dec., 850-879; Mustique, Grenadines **414-415;** Oregon coast 801, 821; ***Yellow Sea Yields Shipwreck Trove.*** Photos by H. Edward Kim. Aug., 231-243
Shirawi, Yousuf 305, 312
al-Shohaty, Mohammed Hizam 257
Shorebirds **158-160, 174-179,** Aug. supplement; Migration 161, 164-165, 169, 171, 172, 175-178
Shrimp **198**
al-Shroogi, Mohammed **310**
Siberia, U. S. S. R.: Diuktai culture 342, 351, 352
Siberian huskies **812-813**
Sidewinder rattlesnake **633**
Sidi (Inadan) 298
Siegmund, Walter P. 528
Sierra Club: Clean-up program 55; Urban parks campaign 104
Silver bracelet 876, **876**
Silver City, N. Mex.: Copper mine near **486-487,** 489
Silver coins: Spanish **852**
Silver mining: Colorado 214, 493, 495
Silversmiths: Inadan 282, 284, 288, silverwork **287**
Silverstein, Fred 529
Simmesport, La.: Water-control structures 378, **384,** 394
Simpson Desert, Australia 624; Vegetation **590-591**
Singer, Arthur, artist: ***Bird Migration in the Americas.*** Aug. supplement
Singing contests: Kamehameha Schools, Oahu, Hawaii **656, 657**
Sitra, Bahrain: Refinery 304
Sitton, Jim 485
Siyeh, Mount, Mont. 132
Skagen, Jutland Peninsula, Denmark: Sunken church near **827**
Skiing: National park system 32, **56,** 67, **68-69,** 71, **74-75,** 78, 79, **129,** 132
Skylab: ***Skylab's Fiery Finish.*** By Tom Riggert. Oct., 581-584
Crewmember **581**
Debris 581, **581,** 582, 583, **583, 584;** Search for 584; Sonic booms 583
Oxygen tanks: Debris **583,** 584, **584**
Reentry 581, 582, **582-583;** Map 582; Sonic booms 583
Water tanks **581**

Skyluck (freighter) **718-719,** 722
Slad, England 443
Sleipnir (eight-legged horse) 832
Sloths, giant ground 330, 333, **340,** 355, 363
Slumgullion Pass, Colo. 213
Smalley, Lloyd 103
Smith, Dave M. 720
Smith, Kerby, photographer: ***The Search for the First Americans.*** Sept., 330-363
Smith Spring, Guadalupe Mountains National Park, Texas **136-137**
Smoky Mountains, U. S. *see* Great Smoky Mountains National Park, N. C.-Tenn.
Snagg, Katherine 412, 414
Snake Creek, Tenn.: Civil War battle 108, 109
Snake River, U. S. 148, 152, 227
Snakes: Rattlesnake **211;** Sidewinder rattlesnake **633;** Water snake **386**
Snow geese **737-739;** Migration 754, 767
"The Snow Queen" (Anderson) 826, 834
"The Snow Man" (Anderson) 828, 833
Snowman **829**
Snowshoe rabbit: Glacier National Park, Mont. 125, **130**
"So Empty, Yet So Full" (Arctic National Wildlife Range). By Douglas H. Chadwick. Dec., 737-769
Soapstone ornaments: Inadan 288, **292-293**
Soccer: Bahrain **323**
Socialism: United Kingdom 448, 453, 456, socialized medicine 472-473
Soldiers: Danish Royal Guard **842-843,** 845-846
Solomon, King (Israel) 251, 259
Sonjo, King (Korea) 775
Sonoran Desert, Ariz.-Mexico 604
Sorrel, Bayou, La. 378, 390
Soucy, Gene 365
Soufrière (volcano), St. Vincent 401, 410; Eruptions 299, 399, 402, 404, **405**
South America: ***The Americas.*** Aug. supplement; Bird migration 156, 164, 165, 170, 173, 177, **178,** 180, ***Bird Migration in the Americas.*** Aug. supplement; Desertification 625, 628; Deserts 597, 604, 625, map 604; Paleo-Indian projectile points 330, **341,** 356-357, 360; Vegetation patterns, map of 339-340
South China Sea: Chinese refugee deaths 711, 713
South Korea *see* Korea, South
South Koreans: Bahrain 304, 306, 313
South McKittrick Canyon, Guadalupe Mountains National Park, Texas 139, 141
South Pass City, Wyo. 488, 496, 502
South Yemen *see* Yemen, South
Soybeans: Louisiana 378, 384, 393
Spaans, Arie L. **178, 179**
Space flights and research *see* Skylab
Space ships: Models **535**
Space shuttle: Engine: Inspection **532**
Spanish galleons: ***Graveyard of the Quicksilver Galleons.*** By Mendel Peterson. Dec., 850-876
Spanish moss: Atchafalaya Basin, La. 389
Sperm-whale oil: Substitute 635, 637
Sphalerite **702,** 703
Spillett, J. Juan 281
Spindler, Mike 752, 754
Spoonbill, roseate **7-8**
Sports: Bahrain 319, 323, **323, 326-327;** Grenadines **398;** South Korea 781, **790;** *see also* Surfing
Spray, Pam and Jerry **486**
Spring Comes Late to Glacier. By Douglas H. Chadwick. July, 125-133
Springer, Justina 805-806
Springville, Utah 220, 221
Squirrels: Ground squirrels **509,** 515, **765**
Stagecoach routes: Oregon coast 808, 813
Stalker, Archie MacS. 351
Standley, Stacy 494
Stanes, Sid 624, **628**
Stanford, Dennis 332, 354
Starbird, Ethel A.: ***St. Vincent, the Grenadines, and Grenada: Taking It as It Comes.*** Sept., 399-425
Starfish **855**
Staten Island, N. Y.: National park 87, 92, 94, 97
Statue of Liberty National Monument, N. Y. 49, **58;** Visitors, number of 59
"The Staunch Tin Soldier" (Anderson) 826, 845; Illustration **842**
Steamboat Springs, Colo.: Skiers **497**
Stebbins, Robert 637
Steel mills: Indiana **57**
Steele, Elizabeth 470
Steller's sea lions **816-817,** 817
Stereo camera **684**
Stevens, Sarah **205**
Stireman, John 427
Stivers, Marie **370, 371**
Stoker, Sam 577
Stomach: Cancer detection 516, 529; Ulcer **519,** laser treatment 529
Stone, Deryl 94
Stone Age: ***The Search for the First Americans.*** By Thomas Y. Canby. Sept., 330-363
Stone carvers: Inadan 288, **293**
Stone ornaments: Inadan **286,** 288, **292-293**
Stone working: Knapping 339, 352, 355, 359, pressure flaking 357; Projectile points 330, **340, 341,** 347, **349,** 351, **352,** 354, 356, 357, 359, 360, 363, *cover;* Tools 339, **337-341, 349,** 351, 352, 354, **355,** 357, 359, *cover*
Stoneware, Chinese: Black-glaze **240;** Celadon 232, **236-239**
Stool End Farm, England 448, 449-450
"A Story of the Sand-Dunes" (Anderson) 826
Strahm's Lily Farm, Harbor (town), Oreg.: Oriental hybrid **820**
Strip mine: New Mexico 490
Strube, William P. 854
Stukey, Larry **201**
Submersibles *see Alvin; Cyana;* PC-8B
Subway: Seoul, South Korea 783, 791, construction 783, **790-791**
Sufyan (tribe): North Yemen 260
Sugar, James A., photographer: ***Oshkosh: America's Biggest Air Show.*** Sept., 365-375
Sugar Act (U. S.): Expiration 675
Sugarcane: Gasohol 678; Grenadines: Plantations 400; Oahu, Hawaii 653, 671, 674, 678
Suha-dong (district), Seoul, South Korea 779
Sulfur springs: Oklahoma 59
Sumac trees **6**
Sumarah Pass, North Yemen 267
Sun Myung Moon 772
Sundials, pocket (16th-century) **871**
Sung Dynasty pottery 238
Sunni Muslims: Bahrain 315; Kuwait 308; United Arab Emirates 308; Yemen 267
Sunset Beach, Oahu, Hawaii: Bodysurfer **673;** Surfing championships 673, 677
Supertankers: Bahrain 305, 318, 319, dry dock 302, 304, **306,** 312, 313, 318-319
Surfbirds **158-160,** Aug. supplement
Surfers: Golden Gate National Recreation Area, Calif. **14,** 102
Surfing: Bodysurfing **673,** 677; History 673; Windsurfing **660-661;** World championships 673, 677
Suriname: ***Tracking the Shore Dwellers: From Canada to Suriname.*** Aug. 175-179
Sussex, West (county), England: Boy's school **474**
Swallows, cliff: San Juan Capistrano, Calif. 170, 180
Swamps *see* Atchafalaya Basin, La.
Swans: Denmark **825**
Sweeney, Ed **375**
Swift Current Campground, Glacier National Park, Mont. 132
Swimming: National park system **33,** 87, **88-89,** 102
Swivel guns, bronze 864
Synthetic fuels: Sources: Gopher plant 617, **617,** 639
Syria: Dust storm **588-589**

UMI

T

Tabelot, Niger 290, 296
Tableware: Spanish galleon 860, 861, **862**
Taejo, King (Korea) 772, 775
Tagua Tagua (Paleo-Indian site), Chile: Depicted **356-357**
Tai ji quan (*Tai chi chuan*) **537**
Tailor: Manama, Bahrain **316**
Taima-Taima, Venezuela: Paleo-Indian site: Finds **341,** 356, 357; Located 341
Taizz, North Yemen: Cholera outbreak 254; Leprosarium 267, 268
Takabuki, Matsuo **652**
Takla Makan Desert, China 606, 617
Talat, Niger 282; Hair stylist **290**
Tales of Mother Goose (Perrault) 825
Tamayariak River, Alaska 753
Tanaina Indian **39**
Tannenbaum, Morris 534
Tansy ragwort: Oregon coast 809
Taro **670-671,** 677; Water needs 671, 677
Tate, Bob and Liz **146**
Taxis: Seoul, South Korea **776**
Taylor, Dan **44-45**
Tea: Bahrain **316,** 328
Telephones: Optical-fiber use 516, 523, 527, 530, 532, 533, diagram **524-525**
Television: Broadcasting: Optical-fiber use 533; Cable TV 533; Special effects 534
Television camera: Charge-coupled devices used in 699, 705
Television films, NGS: Galapagos II expedition 682
Tennant, Colin 412
Tennessee *see* Great Smoky Mountains National Park; Shiloh National Military Park
Tepee, three-story: Colorado **498-499, 506**
Terns, arctic **184-185,** Aug. supplement; Migration 164, 185, 193
Tesmer, Claude 126
Teton Range, Wyo. *see* Grand Teton National Park
Texas: Desertification **600, 601,** 629, 636; Dust storm **208-209;** Natural gas 196, 211, 213; Wind erosion 600, 629, 636; *see also* Guadalupe Mountains National Park
Textile plant: North Yemen **256**
Thailand: Refugees in 712, 713
Thatcher, Carol **449**
Thatcher, Margaret **449,** 453
Thayer, Ave 754
Thermal waters: Yellowstone National Park, U. S. 485, 488, **494-495**
Thermoregulation: Walruses 570, 573
Thiele, Ida **839;** Great-great-granddaughters **839**
Thomas, Bill **368**
Thompson, Lynn 100-101
Thompson, Myron **653**
Thomson, Point, Alaska: Offshore oil drilling, prospective 755
Thoreau, Henry David: Quoted 92
Thorn tree **610**
Thorpe, G.J.Y. 477, 480
"Thumbelina" (Andersen) 826
Thunder Basin, Wyo. 270
Tihamah (plain), North Yemen 254
Tillamook, Oreg. 820
Tillamook County, Oreg.: Dairy industry 818, 820
Timber: Oregon coast 804, 805, 808, **810-811,** 812, 814, logging roads 801
Timbuktu, Mali: Famine 597
Time-division multiplexing 525
Timia, Niger 296; Children **297**
Tin cans: Inadan use **294,** 295, **297**
"The Tinder Box" (Andersen) 826, 844
Tivoli park, Copenhagen, Denmark: Pantomime **837**
Tlapacoya, Mexico: Paleo-Indian site 354, finds **339,** 354; Located 339
Toad, South American **632, 633**
Tobago Cays, Grenadines 415; Divers **411**
Tofflemire, Jim **812**
Toksu Palace, Seoul, South Korea **774-775**
Tolosa, Conde de: ***Graveyard of the Quicksilver Galleons.*** By Mendel Peterson. Dec., 850-876
Armament **855,** 865, 867
Cargo **850-851,** 851, 852, 856, 865, 867, 875
Excavation **855, 858-859,** 865, 867, 873, 875
Jewelry **866,** 873, 875, 876, **876**
Passengers 852, 853
Salvors: 18th-century 853; 20th-century 854, **855, 858-859,** 865, 867, 873-875
Sinking of 853, 856, 857
Survivors 853, **853**
Wreck **850-851,** 852, **855, 858-859;** Located 856, 865, map 857; Painting of **856-857**
Tomatoes: Salt tolerant **626-627**
Tombs, ancient: Bahrain **324**
Tonkin, Gulf of, South China Sea: Chinese refugee deaths 713
Tools, primitive: ***The Search for the First Americans.*** By Thomas Y. Canby. Sept., 330-363
Torquay, England 461
Toure, Abderrahmane 602
Tower of London, London, England 453, **454,** Oct. supplement; Yeoman warder **452**
Townsend, Lloyd K.: Painting by **232-233**
Toys: Inadan children **297**
Tracking the Shore Dwellers: From Canada to Suriname (sandpipers). Aug., 175-179
Trackwell, Russell N. 305
Tractor: Guilin, China **543**
Trade routes, ancient: Arabian peninsula 244, map 251; Far East waters 234
Traleika divide, Mount McKinley, Alaska **66-67, 71-72**
Trans-Alaska pipeline 745; Located 744, 745
Trapping: Atchafalaya Basin, La. 382, 389; Oregon Coast 818
Trees: Deserts **587, 590-591,** 602, 603, **610, 611, 621,** 625, 628-629; North of timberline **748-749,** 756
Trekking Around the Continent's Highest Peak (Mount McKinley). By Ned Gillette. July, 66-79
Trick Falls, Mont. 131
Trickle irrigation: Israel 603, 616
Triple Divide Peak, Mont. 132, 492
Trouble in Bayou Country. By Jack and Anne Rudloe. Sept., 377-397
Trout, Ed 147
Troy, Declan 766
Trucial States *see* United Arab Emirates
Trumpeter swans: Protection of 152
Tuareg (people): ***The Inadan: Artisans of the Sahara.*** By Michael and Aubine Kirtley. Aug., 282-298
Tube worms: Ocean-floor oases **681, 687, 689-691, 699, 705;** Physiology 689
Tumbler, cobalt **872**
Tundra: Plant life **743,** 745, **748-749, 751,** 756, 766
Turner, Christy G., II 343, 351
Turner, John 717
Turner River, Alaska 754
Turtle farm: Pierre Part, La. 383, 389
"turtle" ships 779
Turtles: Migration 170; Pets 383, 389
21° North *see* East Pacific Rise at 21° North
Twin Falls, Idaho 226
Two Englands. By Allan C. Fisher, Jr. Oct., 442-481
Tylos Hotel, Manama, Bahrain: Disco **313**
T'zu-chou (Cizhou), China 240

U

"The Ugly Duckling" (Andersen) 825, 845
Uhl, Bob and Carrie 40
Ulcer, stomach **519;** Laser treatment 529
Ultraviolet photography: Scorpion **630**
Underwater exploration:
Incredible World of Deep-sea Rifts. Nov., 680-705
1. ***Strange World Without Sun.*** By the Editor. 680-688
2. ***Return to Oases of the Deep.*** By Robert D. Ballard and J. Frederick Grassle. 689-705
Unification Church 772

Union forces (Civil War): Pittsburg Landing, Tenn. 107, 108, 110; Shiloh, Tenn. 106, 108-110, 111
Union Island, Grenadines 414, 415
Union of Soviet Socialist Republics: Archaeological sites 342, located 337, 338; Deserts 606, reclamation 616; Diuktai culture 337, 342, 351, 352; Foreign aid distributed 244, 248, 250, 254, 259; Oil 308; Walrus research 574, 580
United Arab Emirates 308
United Kingdom of Great Britain and Northern Ireland:
British Isles; Medieval England. Oct. supplement
Two Englands. By Allan C. Fisher, Jr. Oct., 442-481
Conservative Party 448, 449, 453
Constitution 448, 467
Devolution 472; 1979 vote 448
Labour Party 448, 449, 453, 467
Monarchy 463, 475
Parliament 448, 453, 463, 467
Political system 450
Prime ministers *see* Callaghan, James; Thatcher, Margaret; Wilson, Sir Harold
Union, history of 450
see also England, *outlined;* Scotland; Wales
United Nations: Aid to Chinese refugees 709, 716, 717, 732
United States: Bahrain, relations with 328; Bird population 165; Chinese refugees, aid to 722, 732; Desertification 600, **626,** 627, 628-629, 636; Deserts **592-593,** 604, **607-608,** 636-637; Diplomatic relations with China 547; Malaria: Eradication of 429, 430, 436; North Yemen, aid to 244, 248; Paleo-Indian sites 330, 347, 348, 351, 354-355, 357, **358,** 359, located 338, 339, 340-341; ***A Walk Across America: Part II.*** By Peter and Barbara Jenkins. Aug., 194-229; *see also* Continental Divide National Scenic Trail
United States Agency for International Development (AID): Yemeni project 267
U. S. Army: National parks 26, 27, 94, 101, 102, 103, 104
U. S. Army Corps of Engineers: ***Trouble in Bayou Country.*** By Jack and Anne Rudloe. Sept., 377-397
U. S. Congress: National park system 2, 25, 26, 27, 32, 59, 61, 63, 64, 89, 95, 99
U. S. Customs: Mexican border station **484-485,** 488
U. S. Department of the Interior: Alaska parklands: ***Sharing Alaska: How Much for Parks?*** By Jay S. Hammond and Cecil D. Andrus. July, 60-65; Secretaries 60, **61,** 63, 104; *see also* National park system, *outlined*
U. S. Forest Service 489, 493, 513; Light-amplification device **533**
U. S. Highway 101: Oregon coast 804, 805
U. S. Park Service *see* National park system
Upper Volta: Capital 602; Desertification 610, **610, 611;** Drought 602-603; Locusts **628-629;** Tribespeople 603, **612, 613, 629,** *cover*
Uranium: Colorado 493; New Mexico 489-490; Niger 285, 296; Wyoming 496, 502
Urban parks *see* Gateway National Recreation Area, N. J.-N. Y.; Golden Gate National Recreation Area, Calif.
Utah: Mormons 220, 221, 226; National park **3-5**
Utah prairie dogs **272,** 273, 274, **276-277, 279,** 280
Utah State University: Prairie dog research 276, 281

V

Valcic, Andjelko **704**
Valdez, Alaska: Oil pipeline 745
Valenstein, Suzanne G. 242
Valley of Ten Thousand Smokes, Alaska: Preservation 26
Valsequillo, Mexico: Paleo-Indian site 352, 354, finds **350,** 352
Vanderbilt, Cornelius 92
Vanderbilt, William H. 89, 92
Vases, celadon **237, 239**
Vega, Bernardo 876
Vegetation: The Americas: Map 339-340
Venezuela: Paleo-Indian site 341, 356-357
Vennes, Jack A. **519,** 529
Veracruz, Mexico: Spanish colony 852
Vermont: Chimney-sweep school 819
Verret, Alcide 390
Vetch: China **541-543**
Veterans Administration Medical Center, Minneapolis, Minn. **518-519,** 529
Vickers, Larry 214
Vickers, Perk 214, **215,** 216
Vietnam: ***Hong Kong's Refugee Dilemma.*** By William S. Ellis. Nov., 709-732
Vikings: England 475, Oct. supplement
Virgin Islands National Park, U. S. 27, 34
Virginia: Ice Age 333; National park **50-51;** Paleo-Indians 355, 359
Vivitar Corporation: Photographic enlarger **529**
Voice digitalization: Telephone transmission 532, diagram **524-525**
Voice of America broadcasts: China 552
Voisin, Calvin **380, 381**
Volatile North Yemen. By Noel Grove. Aug., 244-268
Volcanic ash: St. Vincent **404, 406-407**
Volcanoes: Alaska 42; Hawaii **43;** *see also* Soufrière, St. Vincent
Volcanoes, extinct: Oahu, Hawaii **654,** 658, 667
Voyager 2 (spacecraft) 585

W

Wagon, toy: Inadan **297**
Waiahole Valley, Oahu, Hawaii: Development dispute 675
Waianae Range, Oahu, Hawaii 671
Waihee Valley, Oahu, Hawaii: Water-rights dispute 671
Waikane, Oahu, Hawaii: Development threat 677
Waikiki, Oahu, Hawaii **654-655,** 658; Area 653; Building boom 655, 656; Hotels 653, **654-655,** 655, 658, 667; Tourists 655, 656
Waikiki Beach, Oahu, Hawaii **654-655**
Waimanalo, Oahu, Hawaii 679; Experimental agriculture station 678
"Waimanalo Blues" (song): Quoted 677
Waimea Bay, Oahu, Hawaii: Surfing 673; Wave **672**
Walcott, Charles 186, 187, **191**
Wales: Relations with England 443, 450, devolution 441, 448, 450, 472
A Walk Across America (Jenkins) 213
A Walk Across America: Part II. By Peter and Barbara Jenkins. Aug., 194-229
Wall Street, New York, N. Y. **53**
Walrus Islands, Alaska: Walruses 572
Walruses, Atlantic 569
Walruses, Pacific: ***Learning the Ways of the Walrus.*** By G. Carleton Ray. Oct., 565-580
Behavior 569, 574, **574,** 576 *see also* Courting; Feeding method, *below*
Calves **572-573,** 577, 579; Calf hide **579**
Courting 569, 577, 580
Diet 564, 570, 574, 577
Feeding method 570, 576, 577, picture of **571**
Migration 566, 569, 572; Maps 566-567
Polar bears and 565, 577, **578**
Study of: Observation techniques 565, 569, 574, 576-577, 580
Swimming skills 569
Thermoregulation 570, 573
Threats to 574, 579
Weight 564, 569
Walt Disney World, Fla.: Optical-

UMI

fiber telephone cable **530**
Want, Joe **747,** 766, 767
War in the Pacific National Historical Park, Guam 32
Warblers 156, **157,** 172, Aug. supplement; Blackpoll warbler 156, 164, **168-169,** 170, 171
Ward, Fred, photographer: ***Fiber Optics: Harnessing Light by a Thread.*** Oct., 516-535
Waring, George 274
Wartzok, Douglas 574
Washington, George: Statue **53**
Washington: Paleo-Indians: Kill site **358,** 359, artifacts **333**
Washington, D. C. 27; Bicentennial celebration **36-37;** National Park Service 36
Water birds: ***Bird Migration in the Americas.*** Aug. supplement; ***Mysteries of Bird Migration.*** By Allan C. Fisher, Jr. Aug., 154-193
Water buffalo: China **541-543**
Water hyacinth 377, 382
Water lilies: Roots foraged **613**
Water pipes (hookahs) **252-253**
Water sampler **684**
Waterfowl 180, **192-193,** Aug. supplement; Fatality rate, annual 172, 180
Waterman Logging, Inc., Myrtle Point, Oreg. 812, 814
Waterton Lake, Canada-U. S. 515
Watkinson, Harold 474
Watson, Bill 643, 651
Waveland, Miss. 199
Wawona Tunnel Tree, Yosemite National Park, Calif. **18**
Wax busts **458**
Wayburn, Edgar 104
Weapons, primitive *see* Projectile points
Weaving: Navajo Indians **83**
Webb, Walter Prescott: Quoted 639
Welding: Electric arc: Optical-fiber splicing **527**
Well: Upper Volta **612**
Wellstead, Australia: Skylab's descent, photo of **582-583**
Welsh nationalist party (Plaid Cymru) 472
Weminuche Wilderness, Colo. 490, 492-493, 515
West (region), U. S.: ***A Walk Across America: Part II.*** By Peter and Barbara Jenkins. Aug., 194-229
West Indies: ***St. Vincent, the Grenadines, and Grenada: Taking It as It Comes.*** By Ethel A. Starbird. Sept., 399-425
West Rifaa, Bahrain 319; Palace 328
Westerhall, Grenada 425
Western Desert, Egypt-Libya: ***The Desert: An Age-old Challenge.*** By Rick Gore. Nov., 586-639
Wetlands *see* Atchafalaya Basin
Whalen, William J. 19, **32,** 36, 55, 59, 97
Whaling: St. Vincent 410, 412
Wheat field: Oklahoma **638-639**
Which Way Oahu? By Gordon Young. Nov., 652-679
White, Theodore H. 548, 549
White Cross, Colo. 214
White House, Washington, D. C.: Management 36
Whitehill, George **105**
Whitetail prairie dogs 270, 274, 275, 276, 280
Widecombe, England **464-465**
Wiens, Doug 67, **68**
Wigley, Dafydd 472
Wild and Scenic Rivers System, U. S. 2, 32, 60
Wild flowers: Colorado 490, 492, **505;** Montana **509,** 513, 515; Wyoming 502, 510
Wildcat, FM-2 (aircraft): Restored **372-373**
Wilderness Act of 1964 489, 493
Wildlife refuges: Alaska 733, maps of proposed refuges 62-63, 744-745, *see also* Arctic National Wildlife Range, *outlined;* United States 2, 60, **86-87,** 87, 89, 148, 152
Wildlife sanctuaries: England **466,** 480; *see also* Bird sanctuaries
Wilkinson, George 44
Will Success Spoil Our Parks? By Robert Paul Jordan. July, 31-59
Willetto, Frank 490
William the Conqueror 467, Oct. supplement
Williams, Harrison A., Jr. 89
Williams, Janet 164
Williams, Leonard **83**
Williams, Timothy C. 164, 170, 171, 185, 192
Williams, W. T. **224, 225,** 226; Family **201, 224, 225,** 226; Ranch 169, **224-225,** 226, trophies won **201**
Williamson, Bob 489
Wilson, Sir Harold 450, 453
Wilson, Russ 101
Wiltschko, Roswitha 186
Wiltschko, Wolfgang 186, 189
Wind Cave National Park, S. Dak.: Prairie dogs 275, 280
Wind erosion: Texas 600, 629, 636
Wind River Range, Wyo.: Glaciers 492, 502, 510
Windmills (company): Clock made by 864, **870**
Windsurfing: Oahu, Hawaii **660-661**
Windward Coast, Oahu, Hawaii 670-671, 674-675, 677
Windward Islands, West Indies: ***St. Vincent, the Grenadines, and Grenada: Taking It as It Comes.*** By Ethel A. Starbird. Sept., 399-425
Wine decanters: Glass 861, **862, 863**
Wing rider: Oshkosh, Wis. airshow **370-371**
***Winged Victory of* Gossamer Albatross.** By Bryan Allen. Nov., 640-651
Winkelman, Dave 812
Winnan, Hutley 459
Wirth, Conrad L. 27
Wisconsin *see* Oshkosh
Wisehart, Lynn **491**
Witches, dummy: Burning of 828, **828**
Wittman Field (airport), Oshkosh, Wis. **366-367;** Traffic 367
Wold, Thor: Song by 677
Wolf Trap Farm Park, Va. **50-51**
Wolinsky, Cary, photographer: ***Two Englands.*** Oct., 442-481
Wolverton, H.M.S. (patrol boat): Illegal immigrants **728-729**
Women: Bahrain 304-305, **314,** 315, **317, 318,** 329, **329**
Wood, Al 95
Wood-carvers: Inadan 285, 298
Wood-chip industry: Oregon coast 810, **810,** 814
Woodpecker, ivory-billed 378, 396
Woods Hole Oceanographic Institution (WHOI), Mass. 685, 695
Word of Faith Temple, New Orleans, La. 203
World: Desert belts 597, 604, map 604-606; Oil reserves 309
World Bank: North Yemen, aid to 259
World Cup dinner theater, Seoul, South Korea 793; Employees **794-795;** Entertainment 793, 795
World Health Organization: Malaria eradication campaign 436
World Trade Center, Honolulu, Oahu, Hawaii 678
World Trade Center, New York, N. Y. **58, 86**
World War II: Aircraft **372-373;** Japanese bombing of Guilin 540, 548, 549, 552; Pearl Harbor attack 664, 667
Wormington, H. M. 351
Worms: Bristle **686, 698,** 698-699; Pompeii **686, 698,** 698-699; Serpulid **692-693;** Tube **681, 687, 689-691, 699, 705,** physiology 689
Wright, Esmond 453, 456
Wright, Leonard W. 581; Photograph by **582-583**
Wu Nan-ying 713, 717
Wutong Shan (mountain), China 721, 731
Wuzhou, China 552
Wyoming: Great Divide Basin 483, 496, 502, **510-511;** Mining towns, 19th-century 488, 496, 502; National park system 3, **9-11;** Paleo-Indian kill site 347, depicted **346-347;** *see also* Grand Teton National Park; Yellowstone National Park

Y

YC-14 (military transport aircraft) 518
Yahya, Imam (North Yemen) 254
Yangshuo, China: Buddhist temple 556
Yateem, Husain Ali 305

Yateem, Shaherazad 305
Yazd, Iran: Air conditioning, ancient 616
Yazzie, Kelsey **83**
Yellow fever: Mosquitoes and 428, 429, 430, 436
Yellow Sea Yields Shipwreck Trove: A 14th-Century Cargo Makes Port at Last. Photos by H. Edward Kim. Aug., 231-243
Yellowstone National Park, U. S. 3, **27,** 29, 31, **48-49,** 55, 89, 483, 485, 488; Established 27, 32; Old Faithful 27, 49; Thermal streams 488, **494-495;** Visitors, number of 27, 89; Wildlife **48**
Yellowtails (fish) **855**
Yemen: Islam, conversion to 251; Name origin 244
Yemen, North: ***North Yemen.*** By Noel Grove. Aug., 244-268
Capital *see* Sana
Climate 254
Drug use 252, **252-253,** 260, 267
Exports 252, 267
Farms and farming 253, **262-263,** 264, 267; *kat* 260, 267; Poultry farm **265,** 267
Fishing industry **255**
Foreign aid: Civil 254, 256, 259, 267; Military 244, 248, 259
Government 248; Assassinations 248, 256, 258; Coups 256
Health care 254, 256; Infant mortality 256; Leprosarium 267, 268
History: Ancient 244, 251, 259, 260; Imamate 254, 256, 266; Ottoman occupation 248, 254; Republic 244, 248, 250, 260, 267, civil war 256, 266
Imports **248, 249,** 259, 264; Duties 257; Trade deficit 252-253, 264
Maps 250
Markets **248, 253,** 254
Population 254
President, present *see* Saleh, Ali Abdullah
Workers, expatriate 252, 253, 256, 259, 267; Remittances 252, 264
Yemen, South: Capital 248; Government 244, 248; Invasion of North Yemen 244, 250, border war 248, 267
Yeoman warder: Tower of London **452**
Yi Song-gye 772, 775
Yi Sun-sin 779
Yin-yang symbol: Seoul, South Korea **797**
Yongdungpo (district), Seoul, South Korea 781
Yonsei University, Seoul, South Korea 792
Yosemite National Park, Calif. **30-31,** 34, 52, 55; Bridalveil Fall July *cover;* El Capitan 49, 52; Established 26; Jail **45;** Sequoia tree **18, 20-22,** 26; Size 52
Yosemite Valley, Calif. 18, 52, 59; Swimmers **33**
Youido (district), Seoul, South Korea 781
Youido Plaza, Seoul, South Korea: Demonstration **786, 787,** 796
Young, Gordon: ***Autumn—Season of the Smokies.*** July, 142-147; ***Which Way Oahu?*** Nov., 652-679
Young Pioneers: China **550-551**
Yuan Dynasty: Celadon stoneware **238-239;** Porcelain **242-243**
Yukon River, Alaska-Canada 740
Yukon Territory, Canada: Paleo-Indian sites *see* Old Crow River and Basin

Z

Zabid, Yemen Arab Republic 254
Zahl, Paul A. 28
Zallaq, Bahrain: Falcon center 323
Zeederberg, Brian **368**
Zhang Yingchan 555
Zhuang (ethnic group): China 543, 552
Zodiacs (inflatable boats) 642, **642,** 643, 651

INDEXING STAFF

JOLENE M. BLOZIS *Editor*
MARTHA K. HIGHTOWER *Assistant Editor*
JEFFREY A. BROWN
GEORGE I. BURNESTON, III
ANNE K. McCAIN
ELIZABETH MEYENDORFF
BRIT A. PETERSON
SARAH C. WERKHEISER

UMI

UMI